

Love or Protection? Defining and measuring maternal-fetal attachment from the woman's perspective.

Volume One

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Abstract

Existing commonly used maternal-fetal attachment instruments have not been thoroughly tested for reliability and validity; criticism can be levelled for a variety of problems ranging from lack of reliability due to an inadequate underpinning framework to facilitate objective interpretation to limited generalizability due to the sample.

The aim of this study is to acknowledge the centrality of the mother, to use the experiences of pregnant women to generate a definition of maternal-fetal attachment and ultimately create a tool that will act as a reliable, valid and simple measurement.

A mixed method framework utilising a sequential exploratory strategy has allowed qualitative exploration of the phenomenon under investigation followed by quantitative testing of the emerging theory on a much larger and different sample. Phase 1 involved face to face open structured interviews on an opportunity sample of 10 (5 primigravid; 5 multiparous) women in the final trimester of pregnancy followed by 3 focus groups targeting specific groups - primigravid women (6 participants); multiparous women (7 participants) and teenagers (4 participants). Data analysis was through constant comparative methodology. A multidimensional, psycho-biological definition of attachment was generated from the women's own perception of their attachment to their fetus. This was used as a framework to design a questionnaire for the measurement of maternal-fetal attachment. Phase 2 involved the validation of the questionnaire and further testing of the definition. Cohort 1 tested for reliability with 200 participants within their second or third trimester of pregnancy. Following modification of the questionnaire, Cohort 2 a sample of 150 women within the final trimester of pregnancy tested the tool for internal reliability and validity. The generated Maternal-Fetal Attachment Tool (MFAT) following rigorous testing proved both reliable and valid.

Maternal fetal attachment is founded in psycho-biological theory and is a complex multi-dimensional construct. Central to the definition is the woman's need to protect her fetus, attachment develops as the fetus becomes more tangible, it is facilitated through the woman's intergenerational experience of attachment and through appropriate social support. Maternal-fetal attachment facilitates behavioural change to ensure a favourable intra-uterine environment.

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Introduction and Overview

Attachment theory has focused on infant - maternal attachment, the need for the infant to elicit protective nurturing behaviour in their primary care-giver, most often their mother. Maternal attachment to the developing fetus is a relatively new concept within attachment theory (Salisbury, Law, LaGasse and Lester, 2003). During a time when childbirth was essentially a danger to the woman's life or continued well-being, it is not surprising that a woman's primary concern during pregnancy was for her own survival. In Victorian America childbearing was the leading cause of all deaths in women, which during the 1890s soared to the loss of 12 women each day through complications of pregnancy and childbirth (Grantham, 2002). Complications in childbirth continued to threaten the lives and well-being of women into the early part of the twentieth century. In England and Wales in the triennial review into maternal deaths 1930 -1932 the maternal mortality rate was over fifty times higher than current rate at 1660 maternal deaths per 100,000 births (Loudon, 2000). From the 1930s onwards with resources put into improving professional education / expertise, medical technology and social care for childbearing women morbidity and mortality rates fell markedly. With the physical wellbeing of

women assured, the mental health and psychological well-being of childbearing women began to be explored. The changing status of women within society allowed women to make demands of care provided and have their experiences and expectations of pregnancy and childbirth acknowledged and considered.

Deutsch, 1945 (in Condon, 1993, p. 167.) was the first to suggest that maternal attachment began during pregnancy. Maternal- fetal attachment was described by Winnicott (1958) as an emotional investment in the fetus that developed as the woman became increasingly pre-occupied with the developing life within. It has been found that maternal-fetal attachment develops throughout pregnancy and facilitates behavioural changes in the woman that are protective to ensure the fetus has the right environment to promote the development and birth of a healthy baby (Sandbrook & Adamson-Macedo, 2004). Maternal fetal attachment is a relatively novel concept that needs further investigation (Beck, 1999); Salisbury *et al*/(2003) state that the paucity of research is limited by methodological problems and suggests there is a need to develop a range of reliable and valid tool to measure maternal-fetal attachment.

The Aim of the Study:

The aim of this study is to acknowledge the centrality of the mother, to use the experiences of pregnant women to generate a definition of maternal-

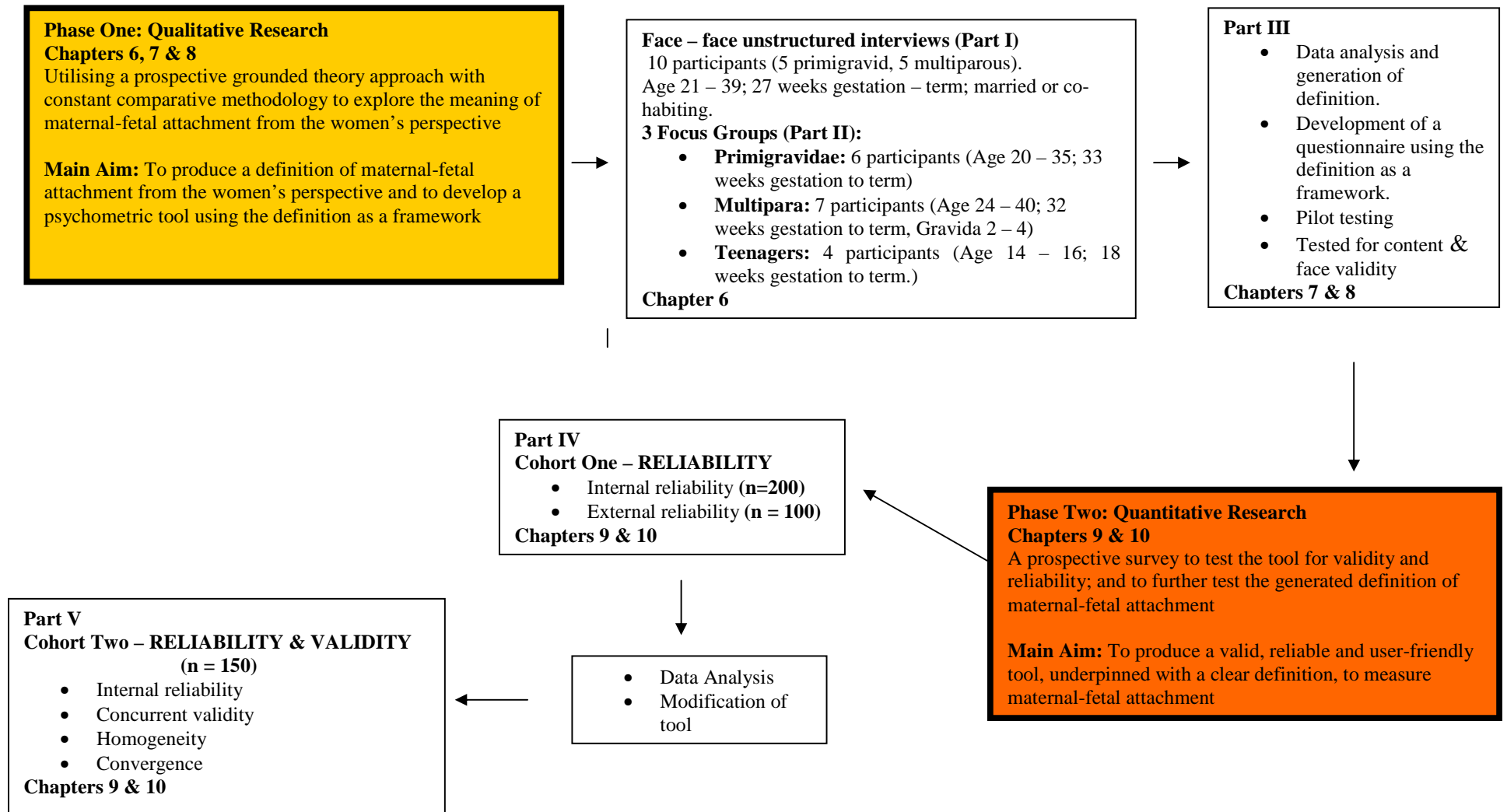
fetal attachment and ultimately create a tool that will act as a reliable, valid and simple measurement. Condon (1993) stated that the maternal internalisation of the developing life within is the quintessence of all maternal attachment as the woman's feelings have not yet been influenced by the infants' temperament and the realities / complexities of parenting. Thus by exploring pregnant women's feelings towards their fetus a candid definition of prenatal attachment can be created. This definition will be used as the paradigm to underpin the production of a tool to measure maternal-fetal attachment. Measurement of maternal-fetal attachment has very positive applications within maternal and child health. Measurement of maternal-fetal attachment can facilitate the understanding, identification and management of psychological problems during pregnancy and early motherhood; including perinatal bereavement, reactions to antenatal diagnostic procedures, relinquishment for adoption and difficulty with early maternal-infant attachment (Condon, 1993; Condon & Dunn, 1988; Frost & Condon, 1996; Siddiqui, Hagglof and Eisemann, (1999); Doan, Cox and Zimmerman, 2003).

The greatest criticism of existing measuring tools is the lack of a systematic definition to underpin the tool and facilitate interpretation. Salisbury *et al.* (2003) state that many maternal-fetal attachment measurement tools are

inadequate, predominately failing to have as a framework a valid operational definition on which to ground / validate the findings. This is supported by researchers whose critical investigation of existing antenatal attachment tools found them to lack a sound and comprehensive definition (Muller, 1992; Condon, 1993; Goulet, Bell, St Cyr Tribble, Paul and Lang, 1998; Doan *et al.*, 2003; Gau & Lee, 2003); this will be further discussed within chapter 4.

The current research used a mixed methods approach to produce a definition of maternal-fetal attachment, create a measuring tool based on the pregnant women's experiences of pre-natal attachment, test the novel tool for reliability and validity and through appropriate revisions based on statistical evaluation present a simple and user-friendly tool (Figure 1). Initially grounded theory has been used to produce a definition based upon the woman's experiences of her fetus; firstly five primigravid (pregnant for the first time) and five multiparous women (already have borne viable children) in the second and third trimester of pregnancy were interviewed, this was followed by discussions within three focus groups - primigravid, multiparous and pregnant young teenagers (aged fourteen to sixteen years old). Following scrutiny for content and face validity, the revised tool was validated utilising quantitative methodology. A sample of two hundred women within the second and

Figure 1 – Overview of the study



third trimester of pregnancy tested the tool for internal reliability, with a subset of one hundred women testing the tool for external reliability. Following analysis a revised tool was tested for validity by a sample of one hundred and fifty women all within the final trimester of pregnancy. The main components of the generated definition of maternal-fetal attachment were also analysed from the collected data, further endorsing the proposed definition.

Literature search strategy:

There is a vast amount of literature on attachment, much of which is eclectic and not relevant to empirical work to produce a definition of and tool to measure maternal-fetal attachment - an electronic search of the databases identified 30,191 results for attachment within PsycINFO 1860 - 2007. Dialog DataStar search engine was used to electronically search databases - including Allied & Complementary Medicine 1985 - 2007, British Nursing Index 1994 - 2007, DH-Data Base 1983 - 2007, Embase 1974 -2007, King's Fund 1979 - 2007, Medline 1996 - 2007 and PsycINFO 1806 - 2007. Utilising key words the following results were obtained - pregnancy (8,361), maternal-fetal attachment (111), measurement (171,337), maternal-fetal attachment and measurement (31). To supplement the search a hand search focusing on maternal-fetal attachment

was conducted, which produced further texts. To focus and refine the search Hardeman, Johnston, Johnston, Bonetti, Wareham and Kinmonth, (2002) suggest the formulation of a set of questions that addresses the key issues to be explored and to provide an explicit structure. Three questions were considered crucial to the search - i) What theories have been proposed that explain maternal-fetal attachment? ii) What maternal-fetal assessment tools have been produced? iii) Have there been any critical reviews of these tools? Abstracts were read and appropriate papers were identified and obtained from a variety of sources including the British Library. Consideration of the questions allowed papers to be quickly reviewed and included or discarded as appropriate; many papers had used maternal-fetal attachment as a basis, factor or measure to explore other issues around childbearing and were therefore superfluous - e.g. anxiety in pregnancy, emotional impact of ultra-sound scanning, the impact of an existing child with congenital malformation, the effects of maternal depression.

A thematic approach was used to shape the literature review, going from an overview of the theory of attachment through to the specific examination of existing tools to measure maternal-fetal attachment. The literature review begins with a broad view of the history of the attachment construct (Chapter One). This is followed by a discussion on the psycho-biological nature of

attachment, which is utilised as the theoretical underpinning for the study (Chapter Two). The multi-dimensional nature of maternal-fetal attachment is then explored, focusing on the different dimensions and considerations that shape the construct (Chapter Three). Chapter Four provides a critical review of the three commonly used maternal-fetal attachment tools. Of the thirty-one results from the electronic search the original papers discussing the development and testing of the three most commonly used measurement tools were chosen, together with six papers that critically analyse the tools through systematic review or following the use of the tool.

Chapter One

The History of the Attachment Concept

It has long been identified that a special relationship exists between the infant and its mother. Rousseau was the first to define the relationship - describing it as maternal love (Goulet *et al.*, 1998). It is however the joint work of John Bowlby and Mary Ainsworth that initiated the concept of attachment; explored and expanded the theoretical basis of the concept and were the first to design specific methodology to empirically research the theory of attachment. Bowlby (1988) states that psychoanalysis was critical within the conception of attachment as a paradigm, psychoanalysis was influential in focusing attention on the importance of the early childhood relationships. Freud (1940) (in Bowlby, 1988, p. 23) depicts the maternal-infant relationship as a powerful, unique and enduring relationship, dependent upon four inter-linking needs of the infant described as - i) secondary drive, learned dependence on a care-giver to provide basic physical needs; ii) primary object sucking, physiological and instinctive urge to suckle at mothers' breasts; iii) primary object clinging, the need for human touch and closeness; and iv) primary return to the womb, infant's resentment at being taken from the security of the womb and the desire to return to its

sanctity. However as the attachment paradigm advanced Bowlby sought concepts from ethology, cybernetics, information processing and developmental psychology to facilitate understanding and formulate the basic tenets of the theory (Bretherton, 1992). Mary Ainsworth, who first worked with Bowlby in 1950 -53, was the first to design an innovative methodology to test Bowlby's concepts of attachment and to expand the theory. Through rigorous empirical work utilising naturalistic observations she identified and explained the concepts of secure attachment and the importance of parental sensitivity to infant cues within the successful development of the attachment relationship.

Bowlby's interest with attachment was fuelled though his observations and work with maladjusted children at a special school, the London Child Guidance Clinic and following World War Two the Tavistock Clinic in London. He produced his first paper on Attachment in 1940 in which he challenged the psychoanalytical view on the centrality of childhood fantasy within relationships. Bowlby stressed the importance of real-life experiences within early childhood particularly emphasising the adverse effects of separation and the pervasive influences of the family environment. He also noted that attachment was intergenerational in nature, with the mother's experiences of being parented appearing fundamental within her ability to parent (Bretherton, 1992). In his

first empirical study of juvenile thieves he highlighted the influence of maternal deprivation and separation on normal psychological development (Bowlby, 1944). He found a relationship between affectionless childhood and crime, from which he postulated that the attachment relationship is more than simply care giving and protective, it is also fundamental within the socialisation of the human infant.

Bowlby through his work with hospitalised and institutionalised children was commissioned to write a report for the World Health Organisation on the mental health of homeless children in post-war Europe; the report *Maternal Care and Mental Health* was published in 1951. The Report stressed the importance of a close, satisfying and continuous relationship with the mother. Bowlby stated that for the child to grow up mentally healthy they should experience "a warm, intimate and continuous relationship with his mother" (Bretherton, 1992, p. 761). However Bowlby identified that the primary caregiver does not have to be the infant's mother, as long as the relationship is satisfying and continuous, a successful attachment relationship can be formed. Within the Report Bowlby also emphasised that for the development of a well-functioning attachment relationship there should be adequate social and economic networks to support

parenting. Attachment was envisaged as a continuing, intimate relationship that facilitates socialisation and healthy mental development.

During the 1950s Bowlby became increasingly inspired by ethology, particularly the work of Lorenz, 1935 (in Cassidy & Shaver, 1999 p. 3) on imprinting - a process underlying the formation of strong social bonds between the young of a species and their caregivers (Bretherton, 1992). Bowlby was particularly interested in the findings that refuted psychoanalytical secondary drive theories and in the research methodology of naturalistic observation - observing participants within their natural environment, as this approach was comparable with methods Robertson and Bowlby had used at the Tavistock Institute. Bowlby's first formal statement on attachment utilising concepts from ethology and developmental psychology was in three Papers presented to the British Psychological Society.

The Papers "The Nature of a Child's Ties to his Mother" (1958), "Separation Anxiety" (1959) and "Grief and Mourning in Infancy and Early Childhood" (1960) were controversial and seriously challenged psychoanalytical theories causing much derision from Bowlby's colleagues. Bowlby (1958) stated that attachment was formed through instinctive emotional responses that bind an infant to its primary care-giver and the care-giver to the infant, with clinging

and following the most important factors for successful interaction. Bowlby refuted the theory of secondary drive, that psychoanalysts and social learning theorists suggested was fundamental to the infant-mother relationship; the relationship it was proposed was based on the infant's need for food, which when satisfied by the mother resulted in an association between pleasure, satisfaction and the infant's positive relationship with their mother. Bowlby noted from ethological studies that baby animals formed strong attachments to their parents who did not necessarily provide food (Lorenz, 1935; Harlow & Zimmerman, 1958 (in Bretherton, 1992, p.762)). This was reinforced by systematic observation of human babies (Shaffer & Emerson, 1964; Ainsworth, 1967), which found that babies also became attached to people who did not feed them. Bowlby concluded that attachment was not associated with or resulted from feeding (Cassidy, 1999). Attachment therefore involves more than survival, it involves survival within the species and integration and acceptance into the social group.

In the second and third Papers Bowlby further explored the consequences of separation from the attachment figure. Bowlby (1958) stated that traditional theories could not account for either the intense attachment children have for their attachment figure or the powerful response to separation. In 1952

Robertson & Bowlby had through observation studies noted that separation causes separation anxiety which results in characteristic behaviours in the infant/child of protest, despair and denial. Bowlby suggested that excessive separation anxiety was the result of adverse family experiences and subsequent poor expectations; a loved child was noted to recover following a short period of protest and to later develop self-reliance. The final and most controversial paper (1960) found that like adults, children suffer grief when their attachment figure continues to be unavailable. He also reiterated the importance of consistent parenting with failure to have consistent care-givers resulting in the child's inability to form deep relationships with others (Bretherton, 1992). Attachment was therefore seen as an important and continuing stable relationship providing not only socialisation but mental stability and the ability to form new relationships.

Inspired by Bowlby's theory of attachment Mary Ainsworth conducted the first empirical study exploring the development of infant-mother attachment. In 1953 Ainsworth conducted naturalistic observations and interviews with women of unweaned infants in Ganda within their own home environment. She was particularly interested in the onset of the infants' proximity promoting signals directed towards their mothers and the women's responses. In the

resulting papers published in 1963 and 1967 the concept of secure attachment was explored. Ainsworth observed three attachment behaviours within the infants: 1) Securely attached - the infants cried little and were content to explore their environment as long as their mother was present; 2) Insecurely attached - the infants cried frequently, even when held by their mothers and explored little; and 3) Not yet attached - the infants were ambivalent to their mothers and showed no differential behaviour. It was noted that secure attachment was highly linked into maternal sensitivity. Ainsworth (1963) states that sensitive parenting is the key to secure attachment; this is achieved through the care-giver focusing on sensitivity to the infant's signals, psychological and physical availability, cooperation with on-going behaviour and acceptance of the infant's needs (Malmberg, Stein, West, Lewis, Barnes and Sylva, 2007).

This was followed in 1963 with collection of data for the Baltimore project, which through naturalistic observation and interviews with twenty- six Baltimore families within the first fifty-four weeks of the infants' life further explored the development of the attachment relationship. Ainsworth was particularly interested in meaningful and appropriate behaviour patterns which explored individual differences in the sensitivity, appropriateness and promptness of

maternal responses to infants' signals. Findings reinforced those of the Ganda project; sensitive and appropriate responsiveness to infant cues resulted in securely attached infants. As part of the research the "Strange Situation" test was developed (Ainsworth & Wittig, 1969) which examines the balance between the quality of attachment and the infants' exploratory behaviours. As expected it was found that a secure, protective attachment relationship facilitates quality exploration that supports the child's development. From the reactions to the reunion with their mothers Ainsworth found empirical support for Bowlby's theories on separation anxiety. The majority of infants sought proximity and contact with their parents on reunion following a short period of protest, however those infants who had been observed to have less harmonious relationships with their mothers showed ambivalent or avoidant behaviour to maternal contact, with some infants demonstrating anger towards their mothers (Bretherton, 1992). A secure attachment figure is crucial to provide safety and comfort to a child that is tired, distressed or presented with a challenging situation - lack of opportunity to develop selective attachments may damage the child's social and emotional development (Rutter, 1979; 1981). Attachment is therefore the innate relationship between infant and care-giver that provides

the child with a secure environment to explore their world and allow them a healthy mental development.

Bowlby originally intended to produce a book to explain, rationalise and advance the theory of attachment, he in fact produced a trilogy entitled *Attachment and loss* in three volumes (*Attachment* 1969, *Separation* 1973 and *Loss* 1980). Within these volumes Bowlby incorporated Ainsworth's work on secure attachment and sensitive parenting, utilised evolutionary theory to underpin a new motivation and behaviour control system underpinning attachment, introduced the concept of the internal working model and further explored the effects of separation and loss (Bretherton, 1992).

In *Attachment* (1969) Bowlby presents a new theory of motivation and behaviour that further challenges psychoanalytic theory. He proposed the concept of cybernetically controlled behaviour systems that are organised into hierarchies, based on the work of Miller, Galanter & Pribram (1960). This approach proposes that behavioural systems although inborn are not rigid and can adapt in response to environmental change, the ultimate function being survival of the species. Attachment behaviours are organised within the individual to allow them to respond to internal and external cues which facilitate appropriate and flexible responses and ultimately ensure protection and survival

of the infant into adulthood and reproductive fitness. Bowlby posits that humans have developed the ability to form internal working models which allow the individual to react to environmental change and take appropriate actions.

Bowlby (1959) proposed that secure attachment is facilitated within each person internal working models of the self, attachment figures, the world and significant others. These internal working models operate outside consciousness allowing the individual to interpret social and environmental cues enabling them to initiate appropriate, safe responses. This increasingly complex model is formed through continued interpersonal and environmental transactions that encounter constant revision becoming progressively more sophisticated. Secure attachment, stability and continued support allow the child to develop and maintain an effective and healthy internal working model. Bowlby suggests that in order to support the child in the development of a secure working model of self the parents should establish an optimal parenting style, which is described as responsive, reassuring and comforting which through open, honest and sensitive communication promotes autonomy (Scott & Hill, 2001). The quality of this relationship is central for the development of an operative social being, the healthy internal working model providing a deep sense of self-confidence and worth (Sroufe, 1986).

Bowlby (1973) postulates that if the parent frequently ignores the infant's signals for comfort or exploration the child is likely to construct an internal working model of the self as unworthy or incompetent. This is potentially harmful as the model on which to predict behaviours and plan appropriate responses is dysfunctional and may lead to disordered relationships (Rutter, 1995). Studies have found that insecure attachment and subsequent disordered behaviour have been identified within abused or neglected children and the institutionally reared child (Sameroff & Emde, 1989; Rutter, 1994). It was found that the abused child demonstrated lack of responsiveness, withdrawal, fear and aggression whilst institutional upbringing was associated with clinging behaviours in infancy, attention seeking behaviours and difficulty in forming close relationships in adolescence. Attachment would appear to be fundamental to the physical, social and psychological well-being of the child and adult. Secure attachment promotes an effective internal working model which allows the individual to live successfully and independently within his changing environment.

Klaus & Kennell (1976) hypothesized that a critical period existed for the instigation and development of attachment immediately following the birth. This assumption was based on their study that has been criticised and challenged for its questionable methodology and limited data (Rubin, 1984; Rutter, 1991).

Gottlieb (1978), Gay (1981) and Rubin (1984) have found that attachment is developmental in nature, without a specific critical period. This is further supported by Rutter (1995) who stated that the initial non-selective attachment behaviours of the newborn which stimulates adults to provide safety and care is fundamentally different to the developing maternal-infant attachment relationship, which does not operate within a limited time-frame. Bowlby later withdrew his initial suggestion of a "sensitive period" of two years during which it was crucial that a secure attachment relationship was formed. This notion of short-term limits to the establishment of attachment relationships has been successfully challenged through empirical studies on adoption, abuse and institutional care which effectively demonstrate that sensitive, patient and committed adoptive parents and professional carers could become secure attachment figures (Sameroff & Emde, 1989; Schaffer, 1990; Rutter, 1991). The formation of an attachment relationship is developmental in nature, without a critical period during which it is essential that the relationship is established, the provision of sensitive, responsive and continuing care-giving will facilitate a secure attachment relationship.

Klaus & Kennell (1976) highlighted the centrality of mother's role and perspective within the attachment relationship, emphasizing its reciprocal nature

of attachment. Attachment has been described (Gay, 1981; Lobar & Phillips, 1992; Goulet *et al.*, 1998) as an interactional process that begins as acquaintance and develops towards the unique attachment relationship. The acquaintance phase is initialised during pregnancy (Goulet *et al.*, 1998) as the woman seeks to get to know her "baby" through intimate physical interaction, technical visualisation and searching for information. This is reinforced following birth with powerful sensori-motor interactions activated through feeding; embracing, rocking and maintaining prolonged visual contact (Bourassa, Couture, Cyr and Malenfant, 1986 (in Goulet *et al.*, 1998); Brazelton & Cramer, 1990). The infant seeks physical and psychological closeness through clinging, following and calling behaviours if these are appropriately satisfied both parties experience reciprocal feelings of love, security and joy (Karen, 1994). In the carers these feelings ensure altruistic commitment to the infant, placing the infant at the centre of their life (Bourassa *et al.*, 1986). The reciprocal pleasure and synchronicity of the interaction serves as a catalyst for the continued strengthening of the attachment relationship (Gottlieb, 1978; Mercer & Ferketich, 1993). Attachment would therefore appear to be a two-way reciprocal relationship developed through learning and experience; with the

relationship both affecting and being affected by the personality and characteristics of both participants.

Bowlby (1988) modified his assumption that attachment was an exclusive monotropic relationship, recognising that attachment relationships are not exclusively monotropic in nature but can be equally as strong with a small group of selective attachment figures (Rutter, 1995). Indeed there is empirical evidence revealing that the majority of children during their first year of life become attached to a small group of familiar people, which in most cultures consists of parents, older siblings, grandparents, aunts, uncles and day care providers (Schaffer & Emerson, 1964; Ainsworth, 1967; Howes, Rodning, Galluzzo and Myers, 1988; Cox, Owen, Henderson and Margand, 1992). However it is suggested that infants have a hierarchy of attachment figures, not all of whom are equivalent, often with a very small number of special caregivers (Bretherton, 1980; Bowlby, 1969).

Bowlby's early beliefs in the importance of intergenerational relationships within attachment have been supported and reinforced by Main's (1991) study into adult attachment. The intimate relationship developed in childhood with parents is fundamental to all subsequent relationships (Fonagy, Steele & Steele, 1991; Main, 1991; Rutter, 1995). Bowlby (1973; 1988) suggests that relationship

patterns are transmitted through social interaction across the generations; interactions between child and care-giver are internalised and become fundamental to the expectation, belief and evaluation of relationships across the individual's life-span and therefore influential upon subsequent generations.

Belsky (1999) proposed that the individual's own experiences of being parented are central within attachment; early experiences affect not only short-term psychological functioning but also the instigation and maintenance of long-term relationships. It is suggested by George & Solomon (1999) that couples who rated their own parental care as loving had better-quality romantic relationships. A secure attachment history results in more harmonious and stable romantic partnership bonds in adulthood. The consequences of which is more sensitive secure parenting (Belsky & Cassidy, 1994).

Rutter (1995) states that significant empirical evidence exists to demonstrate that attachment security remains important throughout life. The presence of a close confiding attachment relationship is protective against stress for both children and adults. Loss of this "love relationship" constitutes a potent stressor to the individual at any time during their life. If loss of the attachment figure is so catastrophic at a time when the individual is perceived as independent, self motivated and capable of autonomy, it suggests that the

attachment relationship is inherent and enduring, becoming fundamental to the individual's functioning.

Attachment is a reciprocal relationship, fostered by sensitive, responsive parenting that develops within the individual a healthy internal working model of self that facilitates socialisation, independence and ultimate survival to reproductive maturity.

Chapter Two

The Psycho -biological Basis of Attachment

It is suggested by Cassidy (1999) that fundamental to attachment theory is the focus on the biological basis of attachment behaviour. Attachment arises from the absolute and continuing dependence of the infant on its caregiver (Redshaw, 2006). Humans are altricial mammals; they are helpless at birth, unable to move necessitating the demand to be carried by their mothers. The infant must have food at regular intervals, and are slow to reach independence and maturity. As a consequence the infant needs to initiate caring behaviours in an adult of the species in order to command continuity of carer who will facilitate their protection and survival (Polan and Hofer, 1999). Bowlby (1969) suggested that the infant's behaviours that stimulate this attachment relationship can be describes as instinctive or predictable. Instinctive behaviour is described by Bowlby (1969) as behaviour that has striking commonalities for the whole species and is important to the survival of the individual. Behaviour that supports survival has been developed through years of intense selection during evolutionary history (George & Solomon, 1999). This behaviour facilitates the development of an organised system of responses to internal and external

cues which allows the individual to respond appropriately to personal need and environmental changes (Cassidy, 1999). It had been identified by theorists that instinctive / predictable behaviour defies definition within a single discipline and necessitates an integrated multidisciplinary approach. Eppel (2005) noted that the complementary links between psychology and biology, between genetics and environmental factors have led to a psycho-biological paradigm to explain behaviour.

The attachment behavioural system has evolved and remains entrenched within human nature as it increases the chances of survival throughout the vulnerable early years of life by instigating protective behaviours in wiser and stronger care-givers (Simpson, 1999). For survival of the species, not only must it be ensured that the child survives infancy but they must survive to become healthy adults capable of successful reproduction and competent rearing of the young and vulnerable (Hamilton, 1964; Simpson, 1999). This necessitates co-operative social living, with appropriate cognitive, social and emotional adaptations to solve the problems of survival, growth, development and reproduction across the lifespan (Clutton-Brock, 1991, Simpson, 1999). Co-operative living necessitates socialisation and the need to collaborate to produce and adhere to group structures, norms, rules and penalties to facilitate

successful group living and survival. Bowlby proposed that cognitive, emotional and behavioural responses were part of an attachment system, inherently part of human nature that has evolved to solve one of the greatest problems of our ancestors - the need to increase the chances of infant survival, in order to ensure species survival (Simpson, 1999).

Behaviour evolved to ensure continued survival is traditionally termed instinctive. Bowlby (1969) identified that there are four main characteristics of instinctive behaviour:

- The behaviour follows predictable patterns in most members of the species.
- It is a sequence of behaviour that follows a recognisable course.
- The behaviour contributes to the preservation / survival of the species / individual
- The behaviour develops without specific teaching.

These behaviours are the result of the interaction between genetic inheritance and the physical, social and psychological environment in which development occurs.

It is debateable as to whether human behaviour can ever be considered instinctive, due its infinite variability. However Bowlby (1969) argued that

certain specific behaviours have commonalities, are found across cultural boundaries and have survival value – Bowlby cited reproduction, care of the young and attachment as examples of such instinctive behaviour. It is further acknowledged that instinctive behaviour in humans is not stereotypical but “idiosyncratic performance by a particular individual in a particular environment” (Bowlby, 1991, p. 39), therefore the performance of instinctive behaviour may fluctuate between individuals. Individuals that are most suited to the environment will be the ones that reproduce most prolifically and in extreme conditions may be the only ones to survive to maturity and reproduce. The survivors will transmit to the next generation the advantages, skills, behavioural and physical characteristics which enabled them to survive (Hagan, 2002). Behavioural characteristics therefore have evolved and been modified over time, resulting in variation to behavioural systems that allows the same end to be achieved through diverse means. The prototype to the behaviour has over time been augmented and elaborated upon, resulting in idiosyncratic behaviour that nonetheless has recognisable patterns and results in benefits to the individual / species (Bowlby, 1991).

It is suggested that the changes in prototypical behaviour can be explained by a control system theory, the basic features of which are purposiveness and

feedback (Cassidy, 1999). Within human behavioural systems the control system is complex and integrated. Bowlby (1969) proposed that instinctive behaviour is not wholly inherited, there is a genetic predisposition to develop the system but this is influenced and differs according to the particular physical, social and psychological environmental conditions in which development occurs. Therefore although all members of the species conform to the overall plan, the particular behaviour in any one individual may be distinctive. It would therefore appear that instinctive behaviour within humans does not fully satisfy the expected characteristics identified by Bowlby (1969). Human instinctive behaviour can be idiosyncratic and does not always follow predictable patterns in all members of the species. The behaviour however is inherent, follows a regular course and contributes to the individual's survival.

Bowlby (1991) suggested that biological and behavioural systems are determined by the environment in which the systems have been operating during its evolution. These systems may be stable or labile. A stable system needs no modification and is complete and viable at the appropriate time in the individual's life-cycle. A labile system allows for modification dependant upon the prevailing environmental conditions, allowing adaptation. To ensure survival a balance must exist between environmentally stable and labile systems. Over time these

behavioural and biological systems will have developed and adapted to their specific environment, resulting in an "environment of adaptedness" (Bowlby, 1991, p. 47).

This is reinforced by Gottlieb (1991) who suggested that species-specific behaviour results from the evaluated interactions of behaviour, the environment and socially learned responses. Gottlieb cited canalisation as the vehicle for this interaction. The concept of canalisation was introduced by Holt (1931) to describe unidirectional prenatal conditioning with information flowing in one direction from gene to structure providing a master plan. Gottlieb (1998; 2000) asserted that canalisation is bidirectional and coactional, arguing that a relationship exists between genetic, neural, behavioural and environmental components. It is not the components on their own that provoke change it is the relationship between the components that affects the change. This supports Bowlby's assumption that it is the interaction between genetic predisposition and the prevailing evolutionary physical, biological, psychological and social environments that affects behaviour.

The term instinctive behaviour has come in for much criticism. The term has been used to describe diverse behaviours according to the user's working definition (Simpson, 1999; Cassidy, 1999). Reber (1995) suggested that the term

instinctive is misused in every day parlance. Bowlby (1991) observed that instinctive behaviour is difficult to accurately define and questions the use of the term to distinguish specific behaviour. Behaviours traditionally described as instinctive are controlled by many different systems that are both stable and labile. Instinctive behaviours therefore range from those that are vital to survival to those that simply contribute. As a consequence it is difficult to accurately denote what is and what is not instinctive behaviour (Bowlby, 1991). Bowlby (1991) suggested that instinctive behaviour be described as "telenomic". This term was introduced by Pittendrigh (1958) to describe any system that is constructed so that when it is activated by its environment of adaptation it achieves predictable results. Reber (1995) defined telenomic as a term used to explain behaviours that have some prescribed purpose. This would appear to be a more precise explanation, as it allows for the flexibility in performance that results from the idiosyncratic ways that humans approach these survival behaviours.

Attachment is a type of survival behaviour, a critical part of normal human behaviour that is essential for the continued well-being of the vulnerable infant (Eppel, 2005). Bowlby proposed that attachment behaviours are instigated when behavioural systems are activated - he described this as the "control theory of

attachment behaviour" (Bowlby, 1991, p. 180). Attachment is the product of a number of behavioural systems that have proximity to the main care-giver as the predictable outcome. Early infant attachment behaviour is characterised by proximity seeking and separation protest (Simpson, 1999; Eppel, 2005). Bowlby suggested that these systems develop within the infant as a result of interaction with its environment, particularly interaction with the principle figure within that environment - the infant's mother.

Attachment between a nurturing and responsive care-giver and the infant is an essential pre-requisite for the newborn's survival (Sjogren, Edman, Widstrom, Mathiesen & Uvnas-Moberg, 2004). However Main (1990) stated that in the terms of behavioural strategies to achieve reproductive success there is a striking asymmetry within the relations of parent / prospective parent and the infant. Main (1990) proposed that as a result of evolutionary adaptedness parents / prospective parents are behaviourally equipped with conditional strategies that allow flexibility in order to deal with differing circumstances and pressures. These conditional strategies include reproductive strategies, parenting strategies and infant care-eliciting strategies.

Reproductive strategies are the result of cultural influence - the economic, political and demographic pressures that prevail within society. This is

supported by Zimmerman and Doan (2003) who found from their study on prenatal attachment of 147 primigravid women, 50 multiparous women and 12 multiparous women who had borne a child with Down's syndrome that attachment was culturally embedded. These cultural variables affect the parents' decisions on the number of offspring, attitudes to the offspring and delineate which offspring should be raised to maturity. High rates of infant mortality are met with increased rates of fertility, emotional distancing from the infant and a decreased tendency to treat children as individuals (Main, 1990). Whilst low fertility rates and long birth intervals it is suggested foster a protective and indulgent model of parenting. Main (1990) further states that infanticide may be practised on those infants that are congenitally malformed or weak to ensure continued reproductive success. Whereas infanticide within contemporary society would be deemed unlawful and unacceptable, there is within the England and Wales a national programme of antenatal screening and selective termination of pregnancy of those fetuses with prescribed congenital anomalies. This serves the same reproductive purpose - eradicating those that may be dependent and be an economic burden to society.

It is widely recognised that sensitive and responsive parenting is the most likely strategy to achieve reproductive success (Redshaw, 2006). However Main

(1990) identified that although all parents should have the capacity for being sensitive and signal alert parents, all parents do not exercise this. Main (1990) suggested that these strategies probably operate outside consciousness.

Parenting strategies all have potential benefits and disadvantages and may depend upon the prevailing climate in which parenting occurs. Strategies include highly responsive parenting, pushing the infant to early independence or inducing prolonged dependence within the infant / child (Main, 1990). It is of note that nature affords parents a prolonged period of reproductive opportunity and therefore the parents do not need to focus entirely on one individual child.

Whilst parents can select from a wide range of alternative conditional strategies to achieve reproductive success, the infant has only one option available. If it is to survive it must draw out care-giving behaviours in those that are available at their birth. Main (1990) therefore suggested that the infant's behavioural system must be more intensely and precisely focused to stimulate the nurturing potential in their parents. Success in eliciting attachment behaviours within a care-giver is key to the infant's survival (Redshaw, 2006). There is now evidence to suggest that these behavioural systems are functioning before birth to equip the infant to stimulate protective behaviours from a

stronger adult care-giver at birth (Moon, Bever and Fifer, 1992; Polan and Hofer, 1999).

The parental attachment relationship is an indispensable condition for the healthy development of the child. It is suggested by Della Vedova, Dabrassi and Imbasciati (2008) that this begins in pregnancy, with maternal awareness of the fetus being crucial to the establishment of this attachment relationship. This is supported by the findings of Righetti, Dell'Avanzo, Grigio and Nicolini (2005) who found that the maternal-fetal attachment relationship develops during the course of pregnancy and is related to the woman's ability to form a cognitive representation of the fetus within. This develops through her own bodily sensations of the viability of the fetus and through technical advances that allow early visualisation of the fetus and intimate knowledge of fetus's physical and sensory development. Technological advances in fetal surveillance have found that rather than haphazard, uncoordinated intra-uterine movement, the fetus demonstrates finely tuned and coordinated motor capabilities, organised sensory motor behaviours, auditory competence and fetal learning capabilities (Della Vedova *et al.*, 1998). This contributes to the woman's ability to develop a picture of her fetus, stimulates her interactions with the fetus and provokes attachment behaviours. Bielawska-Batorowicz and Siddiqui (2008) found in their

study of prenatal attachment in Swedish and Polish expectant mothers that prenatal attachment behaviours demonstrate a commitment to the fetus through changing or adjusting behaviours to ensure the fetus has a favourable intra-uterine environment to facilitate healthy growth and development.

Polan and Hofer (1999) stated that it makes objective sense that the behaviours needed for survival at birth develop during intra-uterine life. They suggested that the maternal body provides sensory continuity to help construct an experiential and behavioural bridge between intra and extra uterine life. This is supported by experimentation that demonstrates the significance of the infant's own mother to the infant's well-being and safety. Moon *et al.* (1992) found that newborn infants preferred and were more easily soothed by their own mother's voice than any other female voice. Moreover infants of 72 hours old were more responsive to their mother's voice when it was prepared in a special intra-uterine version (Moon *et al.*, 1992). This suggests that the fetus has learnt to identify and respond more favourably to the voice that is more likely to provide protection following birth. Further evidence of attunement to the infant's own mothers' voice was produced in experiments by Fifer and Moon (1995), which demonstrated that the heart rate of the fetus at 36 - 40 weeks gestation slowed on hearing their mother's voice, suggesting a calming effect. It

is further suggested by Panskepp (1998; 2003) and Simpson (1999) that maternal and neonatal hormones released at birth stimulate attachment behaviours in both the infant and the mother.

The psycho-biological foundation to attachment is demonstrated within the early postnatal period. Panskepp (1998) proposed that mammals have a specific neuro-circuit that supports and promotes attachment behaviours. He identified that certain hormones and neuro-chemicals were fundamental within this process, particularly oxytocin, prolactin and endogenous opiates. Archavsky (1952) identified that hormones produced by the infant at birth cause the infant to be very alert within the first hour of birth providing an opportunity for the vulnerable infant to stimulate attachment behaviours in its mother. This is complemented by the release of maternal hormones at birth which following birth in a healthy woman tend to make her feel euphoric and receptive to the infant's attempts to further arouse emotional attachment (Eibl-Eibesfeldt, 1989; Simpson, 1999).

The development of attachment behaviours is interactive, the predictable outcome being to ensure the infant instigates and maintains proximity to its mother. Simpson (1995) stated that there is evidence to support that the infant and their mother synchronise behaviour to enhance and develop this attachment

relationship. Both the mother and the infant can recognise each other through the sense of smell within hours of birth. Newborns spend time exploring the contours of the human face, especially focusing on the eyes (Eibl-Eibesfeldt, 1989). This is complemented by mothers, of all cultures, who without instruction interact with their baby at a distance of approximately 30 centimetres - the optimum distance for the infant's developing vision (Eibl-Eibesfeldt, 1989). Klaus and Kennell (1976) and Eibl-Eibesfeldt (1989) noted that mothers make great efforts to establish eye contact with their infants. When infants reciprocated eye contact the mothers became animated and approached their infants more closely. Eye contact and smiling by infants is particularly rewarding to new mothers who perceive these behaviours as signs of affection, which enhances the attachment relationship and provokes caring behaviours (Simpson, 1999).

Schore (2001) identified that the synchronicity and intensity of reciprocal affective interactions between mother and infant were important within the development of healthy attachment. Identifying a link between psychology and neurobiology Schore (2001) found that healthy maturation of the right brain is influenced by the nature and quality of the attachment relationship within the first three years of life. Shore (2001) found that good quality attachment

reduces negative effect and amplifies positive emotion thus allowing the infant to explore and develop to become an autonomous being.

Predictable attachment behaviours include proximity seeking, separation protest and the development of a secure base (Eppel, 2005), the functions of which are to ensure protection and stimulate beneficial caring behaviours in the adult. Panskepp (1998) found a biological basis to explain the relevance of separation distress and the infant's relief at re-union with their attachment figure. In experiments Panskepp (1998) identified that in separation distress endogenous opiates are inhibited, however touch (being picked up and cuddled) activates the endogenous opiate system and allows the infant to be comforted by affording a sense of wellbeing and security. Further research demonstrated that neuro-chemicals reduced the distress caused by separation and actively promoted attachment behaviours.

Attachment can therefore be described as a behavioural system that is natural and inherent. The infant is born with the ability to stimulate caring behaviours within an adult carer, with a predisposition to form an attachment relationship with its mother. The parents are pre-disposed to exhibit care-giving behaviour that ensures reproductive success. These behaviours are finely tuned and complex having been developed throughout evolution to ensure the

survival of the individual and species. The behaviours have developed and adapted through continued interaction with the biological, physical, psychological and social environment encountered. Attachment is a psycho-biological construct.

Chapter Three

Antenatal Attachment - Maternal-Fetal Attachment

Maternal-fetal attachment is a relatively novel concept within the theory of attachment. For many years it was considered that birth marked the beginnings of the relationship between parents and their baby. It is however now recognised that the attachment relationship begins before birth and that this relationship takes a very different form from later attachment (Redshaw, 2006). This is supported by the results of an empirical study by Della Vedova *et al.*, (2008) assessing prenatal attachment in 214 Italian women which concluded that the affectionate relationship between a woman and her fetus is unique, not like any other maternal attachment relationship.

It is acknowledged that childbearing is more than a physiological affair. It is also a social, cultural and personal matter. Childbirth creates new roles and relationships - it is a life transaction that involves major psychological and social adjustment (McCourt, 2006). Kemp and Page (1987) conducted a cross-sectional survey on 83 women in their final trimester of pregnancy to compare maternal-fetal attachment in normal and high risk pregnancies. Cranley's (1981) Maternal-Fetal Attachment Scale (MFAS) was used to measure attachment. It was found

that prenatal attachment scores in both high risk and low risk the women were not significantly different. Kemp and Page (1987) postulated that all women during pregnancy develop feelings of attachment to their fetus which by the third trimester become stable. It was suggested that those women within the high risk pregnancy group had by the third trimester become optimistic that their fetus would now survive and were able to invest within the relationship. They concluded that since attachment occurs both within high and low risk pregnancies that maternal affiliation to her fetus is a normal developmental task accomplished during pregnancy. Maternal-fetal attachment therefore is an individual's emotional response to the growing life within that is mediated by a multitude of complex factors and develops as the pregnancy becomes more tangible.

3.1: Attachment as a Developmental Process:

Attachment has been described as a developmental process that continues throughout the lifespan (Main, Kaplan & Cassidy, 1985). Its beginnings are a source of debate. Most theorists would agree that the origin is within pregnancy (Leiffer 1975; Rubin, 1975). However Ainsworth (1982) suggested that the

attachment process is initiated when the couple embark upon planning a pregnancy and discuss their imagined child and their potential parenting abilities.

It has been suggested that attachment demarcates the psychological progression from narcissism to object love, the individual progresses from being self-absorbed to emotionally investing in another (Sjogren *et al.*, 2004). Bibring (1959) described how within pregnancy the woman becomes increasingly preoccupied with the physical realities of pregnancy, actively focusing her attention on the developing fetal life. It has been observed (Leifer, 1977) that a pregnant woman's affectionate behaviour towards the fetus develops with each progressive trimester; beginning in the first trimester with abstract feelings these progressively become more tangible and personified. Della Vedova *et al.*, (2008) utilised a cross sectional survey to assess maternal-fetal attachment, the efficacy of the psycho-metric properties of the Italian version of Muller's (1993) Prenatal Attachment Inventory (PAI) and the relationship between attachment and alexithymia (the inability to express emotion, influencing affection regulation and interpersonal relationships). The PAI and The Toronto Alexithymia Scale were administered to 214 women in the second and third trimesters of pregnancy. The results showed that maternal awareness of the fetus was crucial to the development of attachment. Siddiqui *et al.* (1999) in a

cross-sectional survey of 171 pregnant women within their final trimester of pregnancy investigated pre-natal attachment. Four questionnaires were administered – two validated instruments Muller's (1993) Prenatal Attachment Inventory and Gissen Complaints List; two unvalidated instruments to measure Expectant mothers' attitude towards pregnancy and the Midwives' rating of prenatal attachment. It was found that initially women fantasise about their fetus, but as pregnancy progresses they become more actively involved with their "baby" stroking and talking to their pregnant abdomens, often giving their "baby" a pet name. Della Vedova *et al.* (2008) also found that attachment developed throughout pregnancy, with prenatal scores increasing significantly for all participants with gestation.

As pregnancy progresses the woman perceives the fetus in increasingly human terms, attributing characteristics and personality traits to the "baby". Benedek, 1959 (in Condon, 1993, p. 167) characterized this phenomenon as the gestation of a person. The physical reality of the pregnancy appears to positively encourage and intensify maternal attachment. Studies have shown that quickening, ultra-sound visualisation, the burgeoning pregnant abdomen and progressively strong and distinctive fetal movements enhance attachment (Kohn, Nelson & Weiner, 1980; Lumley, 1982; Grace 1989; Heinrich & Cranley, 1989).

Sjogren et al. (2004) conducted a study to modify Cranley's (1981) Maternal Fetal Attachment Score (MFAS) for use in both early and late pregnancy and to investigate the relationship between maternal-fetal attachment and personality. One hundred primigravid women were recruited at 13 weeks gestation and randomised into two groups - Cranley's (1981) MFAS and Karolinska Scale of Personality were administered to Group 13 at thirteen weeks gestation and to Group 36 at thirty six weeks gestation. Results showed that maternal fetal attachment scores significantly increase with gestation. They found that attachment in later pregnancy was more intense, characterised by the woman talking about the fetus as a child, wondering whether the child felt cramped in-utero and whether the child would like the name that had been chosen for her.

The development of attachment is reinforced by the woman's emotional equilibrium that is usually achieved during the final trimester of pregnancy. Siddiqui *et al.* (1999) maintained that a woman's emotional state changes during the course of pregnancy, stabilising within the final trimester of pregnancy when she has adapted to the substantial physiological changes of pregnancy. Empirical research by Kemp and Page (1987) also concluded that maternal-fetal attachment develops throughout pregnancy to become stable within the final trimester. Attachment would appear therefore to be developmental in nature, as

the woman gradually adapts to her pregnant state and gets to know her "baby" through their private interactions, technological visualisation and the pattern of the baby's movements.

This developing attachment has been described by Raphael-Leff (1991) as three progressive phases driven by physical and technological cues - belief in the pregnancy, belief in the fetus and ultimately belief in a baby who will survive his/her birth. The birth of a healthy baby, whose actions are programmed to evoke nurturing behaviours within a carer, continues to develop and intensify the attachment relationship. The developmental nature of attachment facilitates the pregnant woman's progress moving increasingly, especially during her first pregnancy, from care recipient to ultimate care provider (Solomon & George, 1996).

Boulanger & Goulet (1994) (in Goulet *et al.*, 1998 p. 1076) claimed that the attachment process begins with acquaintance and progressively develops. During the acquaintance phase, initiated during pregnancy, the parents seek information in order to generate opinions and feelings - an impression of getting to know the person. Doan & Zimmerman (2003) suggested that women and their partners during pregnancy develop mental representations of their fetus. This cognitive ability to conceptualise the fetus as a person with a distinct personality and

temperament is important to the developing attachment relationship. This is supported by Righetti *et al.* (2005) who found that the progressive development of the maternal-fetal relationship is closely linked to the cognitive representation of the fetus. It has been demonstrated in research by Zeanah, Zeanah & Stewart (1990) that 92% of women have apportioned personality characteristics to their fetus, with further research demonstrating that this perception of personality remained stable from pregnancy to infancy (Zeanah, Keener, Stewart and Anders, 1985; Benoit, Parker & Zeanah, 1997).

This knowledge is enhanced with the birth of the baby and its physical presence; pleasure resulting from interactions, closeness and the ability to satisfy the infant's needs strengthens the bond and acts as a catalyst for further exploration of the relationship. In her study Gottlieb (1978) found that as the women's positive attachment feelings progressively developed, women expressed a desire to be close to their child, to possess it and needed to feel proud of it, all these feelings culminated in professed love. This is supported by Bowlby (1958) who suggested that during pregnancy an affectional bond is forming. The woman is at the beginning of the process of gradually falling in love with an entity that she conceptualises as slowly takes human form and achieving viability. The safe birth of the baby affects the change that allows the bond to

develop into a love relationship; this is further strengthened as the woman sees, touches, hears and smells her child. It is suggested by Sandbrook & Adamson-Macedo (2004) from the results of qualitative research that love occurs once the dangers of birth are successfully traversed and the baby is a reality in the woman's arms. It should however be acknowledged that this was a small qualitative study and as such cannot be generalised to the population as a whole.

Attachment is a life-long relationship, although the associated behaviours are most overt within infancy. In adulthood stressful life events cause individuals to seek secure attachment figures for help, soothing and safety (Bretherton, 1992). Weiss (1975; 1982) suggested that as adults seek attachment relationships with partners who can be relied upon to provide comfort and security in times of distress, as with infants the adults will exhibit anguish if the attachment figure becomes unavailable.

3.2: Intergenerational Attachment:

Fonagy *et al.* (1991) stated that there is increasing evidence to support Bowlby's assertion regarding the fundamental importance of intergenerational relationships within attachment. Parent-child interactions are internalised, guiding the infant's expectations and evaluation of relationship experiences.

Main *et al.*, (1985) stated that although early internal working models operate outside consciousness and are therefore resistant to change; they are not passive internalisations of past experience, but dynamic constructions and as such are capable of reconstruction. This internal working model of attachment continues to influence relationships throughout childhood, adulthood and even into the next generation with pregnant women's internal representation of attachment influencing her relationship with her fetus / child (Bowlby 1973; 1988). Zachariah (1994) stated that attachment continues to develop across the life-span with adults maintaining attachment relationships that meet the criteria for infant attachment - i) the person wishes to be with their attachment figure, particularly when stressed; ii) the person gains comfort and security from their attachment figure and iii) the person protests when their attachment figure becomes inaccessible. George, Kaplan & Main, 1985 (in Main, 1991, p. 139) developed a structured interview to classify adults' internal representation of attachment - the Adult Attachment Interview. This is a series of questions designed to obtain an account of the individual's childhood attachment experience and an evaluation of the effects of those experiences on present functioning within relationships. The manner in which these experiences are conveyed yields an overall classification of the adult's internal representation of

attachment. Fonagy *et al.*, (1991) stated that the classifications bear a systematic association to the Strange Situation classification of infant attachment; Dismissing (Avoidant), Preoccupied (Resistant) and Autonomous (Secure)

Bretherton (1992) suggested that personal experiences of being parented fundamentally affect the individual's ability to parent; once internalised and operating at an unconscious level the working model of attachment becomes a blueprint for future parenting - intergenerational attachment (Sroufe & Fleeson, 1985). Parenting attitudes, behaviours and models are passed from generation to generation (Redshaw, 2006). Rutter & Rutter (1993) supported this, with their findings that early experiences of secure selective attachment are associated with a greater capacity to be well-functioning parents. In studies a strong correlation was found between how the mother describes her childhood relationship with her parents and her conceptualisation and subsequent behaviours of attachment (Main *et al.*, 1985; Ricks, 1985). Childhood experiences of sensitive, warm and loving care are strongly correlated with the woman's ability to provide sensitive caring (Main *et al.*, 1985, Grossman, Fremmer-Bombik, Rudolf and Grossman, 1988, Sroufe & Fleeson, 1988). It would appear that the woman's relationship with her mother is particularly influential; women who had

an affectionate, loving relationship with their mothers were more able to establish and maintain positive attachment (Berlin & Cassidy, 1999, Siddiqui, Hagglof & Eisemann, 2000, Doan & Zimmerman, 2003). Cranley (1981a) conducted a longitudinal study on 30 women to investigate prenatal attachment. The women were interviewed during their third trimester of pregnancy and on the third postpartum day. Cranley supplemented data obtained from structured interviews with the State Trait Anxiety inventory and the Maternal-Fetal Attachment Scale produced for this research. Results showed that an important source of nurturance was the woman's own mother. It was found that pregnant women actively sought increased contact with their mothers, particularly in the final trimester. Even women that lived too far away for physical contact reported more frequent telephone communication (Cranley, 1981a). This is supported by Zachariah (1994) who noted that pregnancy is the start of a new attachment relationship for the woman and this can be aided by a positive maternal relationship. During pregnancy reconciliation occurs with the woman's mother who facilitates the woman's acceptance and sense of her developing child (Zachariah, 1994).

Pregnancy is described by Cole & Cole (1996) as a crisis resulting from the interplay of biological, psychological and social factors that facilitates the

passage to parent and protector. There is an upsurge in worries and doubts about the woman's own ability to parent. Ammaniti (1994) suggested that this anxiety is necessary in her first pregnancy for the woman to make the successful shift from protected to protector. A developmental role shift needs to be made by the expectant woman from child to parent, with the expectant parents looking to their own parents for guidance (Durkin, Morse & Buist, 2001).

Pregnancy is the catalyst that stimulates the woman to explore attachment relationships, evaluating her relationship with her mother and allowing her to emotionally invest in the developing fetus. Rutter (1995) emphasized the need to revisit experiences of being parented, stating it is essential to access both painful and happy memories of childhood. This is reinforced by Goulet *et al.* (1998) who concluded, as the result of concept analysis of 196 pieces of literature generated by experts within the field of maternal-fetal attachment, that in order for parents to respond sensitively to their fetus / infant they must have developed an awareness and acceptance of their own emotions associated with their childhood. It is through exploring and coming to terms with one's painful memories that the individual can progress to become the protector of the next generation (Rutter, 1995). Redshaw (2006) concluded that it is simplistic to suggest that experiences of poor parenting necessarily result in

difficulty attaching to their child, if the woman has a clear understanding of their experiences of being parented and are able to fully discuss its impact they may be able to provide sensitive and responsive parenting. Inadequate models of parenting can be modified after childhood by positive experiences with another attachment figure, a supportive partner or within a therapeutic relationship.

3.3: Social Support and Cultural Expectation as a Foundation within the Development of Attachment:

Social support and cultural beliefs have a profound effect on the attachment process, described by Goulet *et al.* (1998) as enablers of attachment. Gottlieb (1978) suggested that attachment derives from instinct and is developed through socialisation and interaction. She argued that instinctive behaviours are moulded through socialisation - other more senior members of the social or family group control interactions so that only culturally acceptable responses are embraced and confounding stimuli eradicated, resulting in learned responsive behaviour. In a pro-natalist society a woman is conditioned and expected to enjoy her pregnant state, revel in her advancing pregnancy and change her life-style to accommodate and nurture the developing fetus into a healthy and strong baby.

The transition to parenthood is a critical developmental phase in an individual's life causing substantial life-style and role changes. The transition to parenthood and the arrival of a new child in the family necessitates personal, social and familial reorganisation. This results in increased stress for all parents and may involve feelings of poorer well-being, with some individuals experiencing distress as they attempt to adapt to the many adjustments parenthood triggers (Dulude, Belanger, Wright and Sabourin, 2002). Durkin *et al.*, (2001) conducted a longitudinal, repeated measures study on 327 couples (247 women / 208 men participated) during the second trimester of their first pregnancy. The study was to evaluate the psychological and psycho-social functioning of couples experiencing their first pregnancy - validated tools were used to measure anxiety, anger, and depression; positive and negative affect; social support; relationship quality and intergenerational attachment. Exploratory factor analysis identified the multi-dimensional aspect of psycho social functioning during pregnancy: four factors emerged psychological functioning; social support from family and friends; the perceived quality of their partnership relationship and the recalled quality of family relationships during childhood. The results showed that responsive, sensitive and appropriate social support can have a positive effect and can prevent distress and depression (Durkin *et al.*, 2001).

McCourt (2006) identified three types of support that facilitate the psychological and social adjustments necessary within the transition to parenthood - emotional, practical and informational. Emotional support, labelled esteem support in Cohen and Ashby Wills (1985) buffering model of social support, is from a warm and caring close relationship that encourages the woman to feel comfortable and valued, building her self-esteem. Practical or instrumental (Cohen and Ashby Wills, 1985) support is identified by McCourt as being crucial for positive maternal-fetal attachment and consists of pertinent physical, proactive or financial support that is evaluated by the woman as beneficial. Informational support is the provision of information or advice that allows the woman to make autonomous choices, increasing her self esteem, confidence and security.

Bloom (1998) stated that pregnancy is a time of preparation for developing psycho-social parenting skills. It is suggested by Goulet *et al.* (1998) that the family provides the context in which intimate links of attachment can be forged. Social supports networks facilitate the parenting role whilst ensuring the couple's intimacy is preserved. Rubin (1984) suggested that maternal identity incorporates the development of increasingly refined images of the self as a mother; this process is complemented by a series of four cognitive / behavioural

tasks of pregnancy. Rubin (1984) identified these tasks as - safe passage for the self and infant; ensuring acceptance of the pregnancy by significant others; attaching to the fetus and learning to give of self. It is suggested by Rubin (1975) that the key to a successful pregnancy is ensuring that the infant is accepted by those significant to the woman.

Unplanned pregnancies may be unwanted by those close to the woman and are associated in many studies with lowered levels of maternal-fetal attachment (Condon and Corkindale, 1997; Green, Coupland and Kitzinger, 1998; Figueiredo, Field, Diego, Hernandez-Reif, Deeds and Ascencio, 2008). Bloom (1998) found that if the child was rejected, maternal-fetal attachment was adversely affected. This may be particularly pertinent within unplanned, adolescent pregnancy. Bloom (1998) conducted a longitudinal survey of 79 pregnant adolescents, aged 12 - 19 years old to investigate the relationship between adolescents' perceived relationship with the father and the development of attachment. Data were collected at 20 weeks gestation, 20 -29 weeks gestation, 30 - 40 weeks gestation and within the first postpartum week. Cranley's (1981b) Maternal-Fetal Attachment Score; Avant's (1982) Maternal Attachment Assessment Strategy and an unvalidated tool to measure the perceived relationship with the father were used to collect data. The results showed that

a satisfying and accepting relationship with the father was significantly associated with higher maternal-fetal attachment scores and reports of more frequent interaction with the fetus.

In a later study on adolescent pregnancy by MacLeod and Weaver (2003) it was found that social support and acceptance of the pregnancy was wider than simply the father and was socially mediated. In their study of 111 / 99 fourteen to eighteen year olds sampled at 20 / 36 weeks gestation it was found that, in contrast to the stereotypical image of the single, socially isolated schoolgirl, the majority of the participants felt well supported by their partner, family and friends. Their pregnancy was accepted by their extended family and friends, all of whom lived nearby and offered emotional and practical support. Three to four people were identified as providing beneficial social support which was associated with high levels of satisfaction. Within this supported sample it was found that although at 20 weeks gestation those that planned their pregnancy were happier, at 36 weeks both groups (planned and unplanned pregnancies) were equally happy and adjusted to their pregnancy. This suggests that unplanned pregnancy may not be an impediment to the development of maternal-fetal attachment, if the woman is afforded accepting and beneficial social support.

Cranley's (1981a) study to investigate maternal-fetal attachment found that the presence of a strong social support system positively correlated with attachment. Interviews with the women revealed that social support can be from a variety of people - friends, colleagues, helping health care professionals, family and partners. Cranley (1981a) found that women desired increased nurturance from those she considered close. Empirical investigation of social support has found that many factors significantly affect the level of the woman's prenatal attachment, including the level of support provided (Condon & Corkindale, 1997); the amount of emotional warmth from the woman's mother (Siddiqui *et al.*, 2000); the woman's perceived closeness to her partner (Bloom 1998) and the mutuality experienced within the family (Wilson, White, Cobb, Curry, Greene and Popovich, 2000). However Condon & Corkindale (1997) found it was more than simply the provision of support. It is the woman's satisfaction with the quality of support provided that is most influential in promoting maternal-fetal attachment. This assertion is reinforced by McCourt (2006) who identified that support is subjective as well as objective, with the effectiveness of the support assessed by the woman's perception as to how useful or beneficial it has been. Cranley (1981a) found that practical support provided by their partner was especially valued. Household chores, shopping, and generally paying

close attention to the pregnant woman's health and well-being especially if this behaviour was new, was found to be very beneficial for the developing attachment relationship.

Cultural beliefs and childrearing practices would appear to make an essential contribution to the developing attachment relationship. Zimmerman and Doan (2003) supported the premise that prenatal attachment is contextually and culturally embedded. Cross-cultural studies have demonstrated that women respond to their pregnancy and child according to the traditions and practices inherent within their society (Bateson & Mead, (1942) (in Bretherton, 1992, p. 764)). However it has been assumed that although attitudes may vary according to the prevalent cultural expectations the woman's conceptualisation of attachment is similar. Bielawska-Batorowicz and Siddiqui (2008) suggested that as physiological processes are universal it could be hypothesised that psychological processes might also be universal. To investigate possible cultural differences within prenatal attachment in Swedish and Polish women, Bielawska-Batorowicz and Siddiqui (2008) measured prenatal attachment during the final trimester of pregnancy in 171 Swedish women and 238 Polish women. They found that although Polish women scored more highly on Muller's Prenatal Attachment Inventory, the conceptualisation of attachment was similar. A study by Wawer

(2006) found that Polish women identified the maternal role mostly with positive and idealised characteristics. It could therefore be concluded that the Polish women were conforming to the expectations of motherhood by demonstrating a strong affection for their fetus, actively demonstrating the customary social desirable response. Sjogren *et al.* (2004) found, in their study to investigate the relationship between maternal-fetal attachment and personality in 100 primigravid women, that social desirability scales were higher during pregnancy and new motherhood. This indicates that pregnant women and new mothers have a greater tendency to do things to satisfy others and to conform to the prevalent cultural expectation of motherhood. Sjogren *et al.* (2004) found a significant positive correlation between the maternal-fetal attachment score and social desirability. A positive correlation was also found between high maternal-fetal attachment scores and guilt, which they suggested may be related to the strong feelings of responsibility pregnant women have towards their fetus. The perceived responsibility together with the need to conform to cultural expectations may result in changed / adaptation of behaviour in order to provide the fetus with a healthy intra-uterine experience. This is supported by Righetti *et al.* (2005) who found that positive maternal-fetal attachment results in

behaviours that demonstrate commitment to the fetus e.g. making appropriate changes to diet or lifestyle.

Bowlby (1951) suggested that the accommodation to pregnancy and subsequent attachment behaviours are further influenced by the woman's social, financial and health status. Inequalities and inadequacies may cause the woman to be so preoccupied with her depleted circumstances that she is unable to respond effectively to the developing prenatal relationship. The woman's satisfaction with her social networks and economic circumstances can have profound effects on the developing attachment relationship, competing with her ability to focus on her pregnancy and infant (George & Solomon, 1999). Attachment would appear therefore to be enhanced by social support and entrenched within the woman's cultural environment.

3.4: The Importance of Partner Support

Perhaps the most influential social support is from a loving partner. Figueiredo *et al.* (2008) longitudinal survey identified that partner relationships are important in facilitating developmental change and the transition to parenthood. Compassionate relationships can contribute to the woman's psychological adjustment, especially when vulnerability, stress and developmental

challenges are high. Simpson (1999) noted that spouses involved in happier and more supportive relationships display enhanced and more sensitive parenting skills. It was further noted by Hazan and Shaver (1987) that individuals within a secure heterosexual relationship demonstrated greater commitment to their partners and were therefore more able to offer consistent support.

Bowlby (1988) stated that expectant mothers had a strong desire to be cared for and supported by their partners. This is supported by Bloom (1998) who found that women expressed a desire for greater attention from their partner as the pregnancy progressed. It was suggested that the experience of being loved facilitates and enhances the woman's ability to love (Bowlby, 1988). Westbrook (1978) found women with positive and sustained support from partners adapted more easily to pregnancy. This is supported by Mercer (1986) who found that positive partner relationships strengthened and maintained the woman's constructive feelings about motherhood and the fetus. This is further espoused by Ballou (1978) who proposed that the ability of the woman to work through attachment relationships and develop an implicit perception of mothering is facilitated by a harmonious relationship with a supportive partner. In Bloom's (1998) longitudinal study of 79 pregnant adolescents sampled three times, once in the second and third trimesters of pregnancy and again within a

week of birth found positive associations between partner support and attachment behaviours. It was found that in the second trimester a close relationship with the father was associated with a higher total maternal-fetal attachment score, more frequent interactions with the fetus and the adolescent was more likely to take on maternal behaviours. Following birth the adolescents with more satisfying relationships kept their babies in close proximity and demonstrated more maternal caring behaviours. The beneficial effects of supportive partners is further substantiated by Gjerdingen & Chaloner (1994) who found the effects strongly impacted on the woman's sense of emotional well-being and self-confidence, with the partner's sensitive caring and appropriate practical help resulting in a reduction in the incidence of postnatal depression.

The woman's partner's attitude and reaction to her pregnancy are powerful contributors to the woman's adjustment to pregnancy, her relationship to her fetus and mothering behaviour (Siddiqui *et al.*, 1999). The partner can either enhance or compete directly with the woman's desire and ability to be a caregiver. Conflict within partner relationships has been found to be directly related to maternal-fetal attachment problems. This conflict could result from the father's own attachment insecurities (Belsky, 1999) which results in the

father's inability or unwillingness to participate within the care-giving partnership (George & Solomon, 1999).

Figueiredo *et al.* (2008) conducted a longitudinal study of 43 pregnant women and their partners to explore partner relationships during the transition to parenthood. Participants were sampled during the second trimester, the third trimester and within fourteen days of the birth. It was found that pregnant women with a low positive relationship score had a significantly higher anxiety score and that those women with high negative relationship scores demonstrated both significantly higher anxiety levels and higher depression levels. From their empirical findings Figueiredo *et al.* (2008) suggested that both members of the couple need support during the transition to parenthood, especially if the pregnancy is unplanned and the couple are unhappy about the pregnancy. Anxiety has been shown to have a significant deleterious effect on developing maternal-fetal attachment (Bloom, 1998; Sroufe and Sampson, 2000). This clearly demonstrates the importance of the partner relationship for the pregnant woman and developing attachment.

Isabella (1993) identified links between partner relationship quality and infant attachment; higher levels of relationship quality predict greater maternal role satisfaction, greater maternal sensitivity and greater attachment security

for the child at a year old. Figueiredo *et al.* found in their 2008 study that participants who were living together had higher partner relationship scores; that these women were happier with the pregnancy and had significantly higher levels of satisfaction. The support of a partner can positively affect the woman's care giving functions providing a secure base from which the woman can rationalize her previous insecure attachment status allowing her to concentrate on her pregnancy and develop attachment to her fetus. This security is provided by not placing conflicting demands on the woman. With her partner providing loving support and practical assistance throughout the childbearing experience the woman is able to focus her attention on the whole childbearing experience.

3.5: Attachment and previous experiences of pregnancy

There is debate as to whether parity influences maternal-fetal attachment. Common sense suggests that all behaviours are to some extent influenced by previous experience. Indeed this premise is fundamental within social development; therefore the experiences of previous pregnancy and the responsibilities of existing offspring must affect the experience of subsequent pregnancy (Cassidy, 1999). Cranley (1981b) and Muller (1992) found no relationship between existing children (parity) and maternal-fetal attachment.

This finding has been replicated by people using Cranley's (1981b) Maternal Fetal Attachment Tool. However these results have been criticised as being biased resulting from poor reliability of the items within the questionnaire (Grace, 1989; Muller & Ferketich, 1993; Condon, 1993). Other studies have found a clear relationship between previous experiences of pregnancy, both positive and negative, and lowered maternal-fetal attachment (Mercer, Ferketich, May, DeJoseph and Sollid, 1988; Mercer & Ferketich, 1993; Siddiqui *et al.*, 1999). Haedt and Keel (2007) in a study, of 204 women between 2 - 40 weeks gestation, to investigate associations between maternal-fetal attachment, depression and body dissatisfaction found that parity significantly affected maternal-fetal attachment scores. Primigravid women reported significantly higher maternal-fetal attachment compared to multiparous women.

Primigravid women are more emotionally involved (Leifer, 1977), more pre-occupied with their pregnancy and the growing fetus and expressed more pleasure about the pregnancy (Siddiqui *et al.*, 1999). Similar results were found in non-pregnant women who wanted to become pregnant (Zimerman & Doan, 2003), it could be concluded that these women were responding to a novel experience and possibly idealising pregnancy and motherhood. It should also be noted that when using Condon's (1993) Maternal Antenatal Attachment Scale the

results show that although the multiparous women scored lower on the frequency subscale, they scored consistently similarly to the primigravid women on the quality subscale (Zimmerman and Doan, 2003). This suggests that attachment is similar in both groups, but may be confounded by pressures of existing family life. The experiences of childbearing, parenting, daily family life and financial matters appear to be more prominent within the concerns of the multiparous women. With these material concerns to pre-occupy them, the multiparous women do not have the luxury to immerse themselves within the pregnancy. Pregnancy must fit into family life (Condon & Esuvaranathan, 1990).

Previous childbearing loss also affects some women's experiences of pregnancy. Perinatal loss is a distressing and confusing event that can have serious long-term effects for parents. Perinatal bereavement is difficult and complex, death occurs at a time when new life is expected and there may be no tangible evidence that the baby ever existed. When a subsequent pregnancy occurs the woman may doubt her ability to produce a live baby, entering the pregnancy with concerns that something will happen in this pregnancy too (Cote-Arsenault, 1999). Armstrong & Hutti (1998) and Armstrong (2002) investigated the effects of perinatal loss on subsequent pregnancies - by comparing the responses of pregnant women who had experienced a perinatal loss, women who

had already had a pregnancy and primigravid women. Armstrong & Hutti (1998) found that those women who had experienced loss exhibited greater levels of stress and anxiety together with lower maternal-fetal attachment scores.

However in Armstrong's (2002) study it was found within the group who had suffered perinatal loss although they showed increased symptoms of depression and higher pregnancy specific anxiety, there was no significant differences within the levels of attachment to the other groups who had not experienced loss. In 2004 Armstrong investigated the impact of perinatal death on a subsequent pregnancy. A cross sectional survey was conducted on 40 couples who had suffered a perinatal loss at any gestation and were in the second trimester of a subsequent pregnancy. It reinforced Armstrong's earlier study that the women reported increased depressive symptoms and higher levels of pregnancy specific anxiety. An inverse correlation was found between pregnancy specific anxiety and maternal-fetal attachment, as anxiety increased maternal-fetal attachment scores lowered. Armstrong suggests that this could be a self protection mechanism, a type of psychological loss adjuster, allowing the women to distance themselves from the psychological trauma of another perinatal loss. However there was no relationship between psychological distress and maternal-fetal attachment. An interesting finding was a significant

difference between the psychological distresses expressed between the couple - women reported significantly higher levels of depression and anxiety than men. This suggests a potential for relationship conflict and lack of support. It is also important to note that Armstrong (2004) found the bereaved women to be at increased risk of postnatal depression. This identifies couples that should be targeted for support during pregnancy to prevent potential morbidity.

3.6 Prenatal Attachment and High Risk Pregnancy

A high risk pregnancy can be defined as a pregnancy complicated by any conditions that pose a serious risk to the health or life of the woman or her fetus (Kemp and Page, 1986; Dulude *et al.*, 2002). The transition to parenting involves increased stress in all parents. Stainton, McNeil and Harvey (1992) suggest that adaptation to pregnancy may be disrupted when the woman experiences complications as she is faced with the uncertainty of a successful pregnancy outcome. In studies hospitalised women experiencing a high risk pregnancy in comparison to a low risk have reported significantly higher levels of anxiety and depression (Mercer *et al.*, 1988); lower self esteem, less positive evaluation of the pregnancy (Heaman, 1998) and withholding of maternal-fetal attachment (Snyder, 1984).

Dulude *et al.* (2002) conducted research to investigate psychological distress and couple adjustment within a high risk pregnancy. Forty-five couples were sampled - 22 high risk and 23 low risk. It was found that all couples within the study reported a degree of distress and anxiety; this did not differ significantly between the cohorts. The transition to parenthood appears to have a negative but transitory effect on the psychological well-being of all parents. It was found that compared to the low risk cohort, the high risk cohort made significant adjustments to parenthood earlier and had more realistic expectations of parenting. A significant and important point is that the high risk cohort demonstrated a more stable psychological distress profile. Dulude *et al.* (2002) found that the parents with positive, effective coping strategies were able to deal with the heightened stress and increased demands of a complicated pregnancy. Positive coping strategies were fundamental to the quality of the adaptation to a high risk pregnancy. This supports the earlier findings of Yali and Lobel (1999) that positive coping strategies were associated with reduced pregnancy specific distress and increased commitment to the fetus.

With both low and high risk women demonstrating similar levels of psychological distress, it has been suggested that it is the woman's own perception of risk that could mediate the psychological response (White,

McCorry, Scott-Heyes, Dempster and Manderson, 2008). Ford and Hodnett (1990) found that women with high risk pregnancies made an appraisal of their own risk that was often different and distinctly more positive than the risk status determined by health care professionals. White *et al.* (2008) conducted a study to investigate maternal appraisal of risk, coping strategies and prenatal attachment in 119 women at least 24 weeks gestation, hospitalised for at least 48 hours with a high risk pregnancy. It was found that a positive appraisal of risk was associated with higher maternal-fetal attachment scores; the intensity of attachment was enhanced when pregnancy was planned and a marital relationship was associated with a higher maternal-fetal attachment score. It was also found that those women with unplanned pregnancy were more vulnerable to attachment difficulty; this could be the result of a negative appraisal of risk. An important finding within White *et al.* (2008) research reinforces the earlier findings of Ford and Hodnett (1990) that the medical assessment of risk was unrelated to and was not reflected within the woman's own risk appraisal. The woman's appraisal of threat to the pregnancy is crucial, as this influences the development of coping strategies and positive appraisal coping strategies are associated with reduced psychological distress and higher levels of attachment. It can be concluded that it is not the risk status that affects attachment; it is

the woman's perception of risk that is fundamental to psychological processing. Therefore low risk women who perceive risk are as vulnerable to psychological distress and lowered maternal-fetal attachment.

3.7: Antenatal Depression and Attachment.

Antenatal depression is a relatively novel concept within obstetrics, and has been somewhat neglected in relation to postnatal depression. Yet evidence has demonstrated that antenatal depression is as prevalent as postnatal depression and that the severity of and nature of depressed mood does not differ (Rubertsson, Waldenstrom and Wickberg, 2003). Depressive symptoms during pregnancy have been found to be a significant predictor of postnatal depression. Several studies have found a significant correlation between lower levels of attachment and depression within the final trimester of pregnancy (Condon and Corkindale, 1997; Lindgren, 2001). Rubertsson *et al.*, (2003) state that the causes of antenatal depression are complex and for this reason it is difficult to identify those women at risk.

Rubertsson *et al.*, (2003) conducted a national study involving 3011 pregnant women to investigate the prevalence and risks associated with antenatal depression. It was found that 8% of participants were suffering from

antenatal depression. The most significant risk factors for both primigravid and multiparous women were - lack of social support from partner / family; two or more stressful life events within the last year and non-native women. This was followed by a further national study of 2674 women sampled during pregnancy and postnatally (Rubertsson, Waldenstrom, Wickberg, Radested and Hildigsson, 2005). It was found that there was a significant association between antenatal and postnatal depression. Risk factors included difficult social situation; social isolation and lack of support; concerns about the physical and mental health of the woman and problems with the infant.

Early identification of those women at risk would allow appropriate support to be targeted for these women. This may reduce maternal morbidity, facilitate the development of attachment and prevent long-term consequences of maternal depression on the infant.

In conclusion it would appear that Maternal-fetal attachment is multidimensional in nature - with biological, personal, social and cultural factors all working together to influence the woman's emotional attachment to her fetus. Maternal-fetal attachment is multi-faceted and interwoven, it extends beyond the

mother-fetal dyad, and it is embedded within the larger family unit and social environment of the woman (Goulet *et al.*, 1998). The biological, social, cultural and personal factors are interwoven and interdependent, intrinsically affecting the development of maternal-fetal attachment. This is supported by Salisbury *et al.* (2003) who found that antenatal attachment is contextual, interacting with demographic, personality and situational variables and is influenced by culture, social support, marital relationships and perceived health status. This is further supported by Siddiqui *et al.* (1999) who suggest that prenatal attachment is a "nested structure of various dimensions, which do not exist independently but are interwoven with each other" (p. 377). As stated by Redshaw (2006) maternal-fetal attachment is different from attachment at any other stage of an individual's life. This is supported by empirical evidence from Della Vedova *et al.* (2008) study assessing prenatal attachment in Italian women. Their results showed that the maternal-fetal attachment relationship is unique and very different from the relationship that develops following the infant's birth. Maternal-fetal attachment is more than an emotional response to the developing life within, it is a response to a life changing event. In this acquaintance phase of attachment the development of this unique affectionate relationship is

dependent upon many factors all of which fundamentally affect maternal-fetal attachment and must be taken into account in any measurement of the construct.

Maternal-fetal attachment is dependent on a multitude of factors including - whether the woman planned and is happy to become pregnant, her previous experiences of pregnancy, her own experiences of being parented, the social support she experiences, her relationship with her partner and her experience of pregnancy. A comprehensive measure of maternal-fetal attachment should include questions that have been shown to inherently affect the woman's attachment; a measure of the woman's feelings alone would not adequately assess the development of attachment that has been shown to be interdependent on other factors. This is supported by Sjogren *et al.* (2004) who stated that a measure of maternal-fetal attachment should include more than the abstract emotional attachment found within psychology. A comprehensive measure will include questions that reflect psycho-social factors and the need for basic security which reflects the realities of childbearing.

Chapter Four

Measurement of Maternal-Fetal Attachment

The three most commonly used maternal-attachment measurement tools are Cranley's (1981b) Maternal-Fetal Attachment Scale (MFAS), Condon's (1993) Maternal Antenatal Attachment Scale (MAAS) and Muller's (1993) Prenatal Attachment Inventory (PAI), these tools will be critically examined. A summary of these measurement tools and the statistical analyses applied to ascertain the reliability and validity of the instruments is found in Table 1 on page 88.

4.1: Cranley's (1981) Maternal-Fetal Attachment Scale

Cranley produced the first validated measuring tool for maternal-fetal attachment (Table 1). The framework for the tool was formulated as the result of a literature review and discussion with experts within antenatal care (clinicians and Lamaze teacher's literature). This evidence base can be criticised as the information is based on the expert's interpretation of pregnant women's emotions and behaviours, not on the women's own experiences. The resulting definition underpinning the tool is "*the extent to which women engages in behaviours that represent affiliation and interaction with their unborn child*"

(p.282). Six subscales were identified - i) Differentiation of self; ii) Interaction with the fetus; iii) Attributing characteristics and intentions; iv) Giving of Self; v) Role Taking; vi) Nesting. Items were drafted from the six subscales.

Following scrutiny by experts (content validity) and pregnant women (face validity) an instrument of 37 items was formulated. Each statement was followed by 5 responses from "*most of the time*" to "*never*" (p.282).

This tool was validated using a sample of 71 women between 35 - 40 weeks gestation; this is an extremely small sample which could confound the results. Cohen (1988) suggests a minimum power analysis of 0.8 - for a 37 item instrument this would necessitate a sample of at least 296 participants to give statistically meaningful results. Demographic data are only provided for the second cohort of 30 women recruited from an antenatal clinic, so the results from the whole cohort (71) cannot be evaluated as representative of the pregnant population with subsequent transferability of results. Following data analysis for internal reliability the subscale for "Nesting" was eliminated with an alpha of 0.1, in all 13 items were considered unreliable, leaving a 24-item instrument, representing 5 subscales with a Cronbach's alpha coefficient of 0.85, demonstrating good internal reliability. However the internal reliability within the subscales was poor, with 4 out of the 5 subscales achieving an alpha of < 0.7 ,

suggesting these may not consistently be measuring the same construct.

External reliability to measure the consistency of items over time was not performed. Predictive validity was performed by correlating the results of the MFAS with Broussards's Neonatal Perception Inventory (NPI). It was predicted that the relationship between mother and fetus would positively correlate with the woman's perception of her baby following birth, however there was no correlation ($r = 0.01$, $p = 0.44$). Nonetheless as the NPI instrument measures a potentially different construct, the results would not necessarily correlate with maternal-fetal attachment, therefore this may not have been the most effective method of measuring predictive validity. Concurrent validity was not done; as this is the first maternal-fetal attachment tool there was no validated tool to compare. However there were no attempts to test validity utilising tests for construct validity.

Since its development in 1981 many researchers into prenatal attachment have used Cranley's Maternal Fetal Attachment Scale (MFAS) questionnaire as a measuring tool. Muller (1992), Condon (1993) and Condon & Corkindale (1997) criticize Cranley's MFAS for its lack of an explicit paradigm of attachment on which to base the questionnaire and facilitate interpretation; Doan *et al.* (2003) reinforced this supposition stating that Cranley's definition of maternal-fetal

attachment is too vague, needing greater clarification in order to validate the findings from the questionnaire.

Several psychologists who utilised Cranley's psychometric tool (Kemp & Page, 1987; Mercer *et al.*, 1988 and Zachariah, 1994) criticised the reliability of Cranley's subscales, with the six subscales originally identified by Cranley being impossible to recreate in later research that utilised Cranley's questionnaire.

Muller (1992) conducted a critical review of prenatal attachment research; she found the use of Cranley's MFAS gave inconsistent and conflicting results.

Muller provided as an example of the inconsistency of the results when three researchers explore the effects of anxiety on maternal-fetal attachment.

Cranley (1981a and 1984) found no correlation between anxiety and MFAS, Gaffney (1986) found a negative correlation whilst Mercer *et al.* (1988) found a positive correlation - demonstrating the lack of consistency and making results questionable. Studies also found that expected relationships between high / low risk pregnancies, parity, planned / unplanned pregnancy and attachment did not result when using the MFAS. Mercer *et al.* (1988) concluded that these substantial difficulties with reliability and validity question the efficacy of the tool.

Condon (1993) challenged the validity of Cranley's MFAS stating that certain items within the test more accurately reflected the women's attitude to their pregnant state / motherhood role rather than their feelings towards the developing fetus. A resulting low score for attachment based on this invalid assumption would negatively affect the women's scores. Reading, Cox, Sledmere and Campbell, (1984) and Condon (1985) found that attachment was a complex phenomenon and that disenchantment with the pregnancy state does not negatively affect their attachment and is entirely compatible with high levels of attachment to the fetus. Sjogren *et al.* (2004) in their study of 100 primigravid women to investigate the relationship between maternal-fetal attachment and personality used a modified Cranley's MFAS. Their findings support the shortcomings identified by earlier researchers (Gaffney, 1986; Mercer *et al.*, 1988; Condon, 1993). They criticised the tool for its contradictory results, the paucity of questions related to the woman's emotions to the fetus and the lack of specific questions about emotional detachment.

4.2: Condon's (1993) Maternal Antenatal Attachment Scale (MAAS)

Condon aimed to produce an instrument that is capable of measuring the subjective experiences characteristic of antenatal attachment (Table 1). He

uses as the working definition of attachment as an "emotional tie" or a "psychological bond". The framework used to underpin the questionnaire is a model of phenomenology of adult attachment, which identifies love as the core experience of attachment. This model has five "dispositions" i) To know; ii) To be with / interact; iii) To avoid separation; iv) To protect and v) To gratify needs (Condon 1993, p.169). It could be argued that it is difficult to equate maternal-fetal attachment, which is at its genesis, with adult attachment that has developed over many years and been influenced by experiences and societal norms. It can be further argued that as love is an abstract and subjective phenomenon that is difficult to comprehensively define it is difficult to scientifically analyse.

The items were generated from literature reviews and unstructured interviews with expectant couples, for maternal attachment it may have been more credible to interview the couple separately to gain more meaningful responses as the woman may have been influenced by her partner's presence. 65 experiences and behaviours were originally created, after examining for ambiguity, idiosyncrasy and potential misinterpretation; these were reduced to 36 items that were distributed evenly over the 5 dispositions of adult

attachment. A pilot study involving 54 couples tested the instrument for face validity and subsequently reduced the items to 27.

The tool was validated with a small sample of 112 pregnant women, in any trimesters of pregnancy. With a minimum power calculation of 0.8 for statistical analysis to be optimum a minimum sample of 216 participants would be needed to validate a 27 item questionnaire. It is also suggested that the most useful sample to test an emotional construct in pregnancy consists of women in the final trimester of pregnancy when their emotional state calms (Siddiqui *et al.*, 1999). Following statistical analysis for internal reliability 8 items were eliminated, resulting in a 19 item questionnaire with a Cronbach's alpha coefficient of 0.82 which is acceptable. External reliability was not performed. Factor analysis did not support the 5 dispositions identified within the underpinning framework of adult attachment. Items loaded on only 2 factors which Condon described as Quality of Affective Experience (Quality) and Quantity of time / Intensity (Frequency). This questions the underlying paradigm of adult attachment used as the dispositions are not reflected within the main factors identified within the questionnaire - questioning the existence of a framework. There were no tests for criterion-related validity, which is an assessment of how adequately the test can be used to infer / predict an individual's behaviour.

Zimmerman & Doan (2003) questioned the reliability and validity of the two subscales within Condon's MAAS. Zimmerman & Doan conducted a study to discover women's experiences of attachment within 3 different groups - primigravid (171), multiparous with "typical" children (50) and multiparous with children with Down's syndrome (12), utilising the MAAS to measure maternal-fetal attachment. It was found that regardless of the condition of the multiparous women's offspring they scored lower on attachment than the women having their first pregnancy. The results showed that although the multiparous women scored lower on the frequency subscale, they scored consistently similarly to the primigravid women on the quality subscale - this then leads to confusion as to the importance of each measure. Zimmerman & Doan state that the implications of the confounding result is difficult to interpret. If the importance of the measure lies in the quality subscale then the lowered score in the frequency subscale is of no concern; but if the subscales have equal importance then further explanations are necessary. This confusion only occurs in multiparous women. Indeed it was found that for primigravid women there was considerable overlap of the subscales. This questions the efficacy of the two scales and indeed calls into question subsequent results, when Condon does not identify the relative importance / significance of the subscales.

The use of Condon's tool in later research by Condon & Corkindale (1997) found that some items are worded in such a way as to result in socially desirable responses, thus invalidating some results. In an abstract concept as emotionally charged as maternal-fetal attachment where the expectations in many societies are that all women should immerse themselves in their pregnant state and altruistically change their life-style it is important to ensure that the items are not written in a way where it is possible to answer as society expects and not as the women truly feel.

It has also been criticised for not representing the attachment experiences of multiparous women (Condon & Esuvaranathan, 1990) with the potential for multiparous women to be unfairly judged. The disposition "*to know*" results in items quantifying "*information-seeking behaviours*", for many multiparous women, unless there has been a problem with earlier pregnancies they judge / measure their current pregnancy against their earlier experiences and do not actively seek information (Sandbrook & Adamson-Macedo, 2004) thus scoring lower on these items.

4.3: Muller's (1993) Prenatal Attachment Inventory

Muller's purpose for producing her instrument was to make maternal-fetal attachment measurement more robust. By producing a tool that emphasized affiliation and emotional attachment (Table 1) to be used concurrently with Cranley's tool which predominantly emphasized behaviour, a more comprehensive and accurate measurement could be gained. Muller defined antenatal attachment as a unique, affectionate relationship that develops between the woman and her fetus during pregnancy. She developed a model of attachment - initial attachment experiences lead to an internalisation of attachment which influences subsequent attachment and affects the woman's other attachment relationships and her adaptation to pregnancy. Items were generated from literature searches, leading to the formulation of 48 items with 4 potential responses to each item. These were examined by 11 experts for content validity and 19 items were eliminated, resulting in a 29 item instrument.

A substantial and sufficient sample of 310 pregnant women between 14 and 41 weeks gestation were used to validate the Prenatal Attachment Inventory. The great range in the gestation of the women within the sample must be questioned. Women within the early weeks of the second trimester of pregnancy are still coming to terms with their pregnant state. Siddiqui *et al.*,

(1999) found that women reach emotional equilibrium within the final trimester of pregnancy. This therefore is a more appropriate time to test a tool measuring emotional attachment to their "baby", as the results will be more consistent. The sample can also be criticised as not being wholly representative of the pregnant population - 93% were co-habiting, 63% were primigravid and 60% were middle - upper class. Internal reliability was good, following deletion of 2 items, with a Cronbach's alpha coefficient of 0.81. External reliability was not assessed. Concurrent and construct (convergence) validity was examined using as a comparison to Cranley's MFAS ($r = 0.72$). However an attempt to demonstrate construct validity by utilising the Maternal Adjustment & Maternal Attitude Scale (1984) and the Kansas Marital Satisfaction Scale (1986) to test correlations regarding pregnancy adaptation and marital satisfaction did not demonstrate correlation. Factor analysis was inconclusive.

Table 1: Commonly used measures of maternal-fetal attachment

Instrument and author	No of participants	Weeks gestation	Items (subscales)	No of points on scale	Reliability		Validity		Criterion-related Validity		Construct Validity			
					IR	ER	FV	CV	Conc	Pred	Hom	Conv	Div	FA
Cranley (1981) Maternal Fetal Attachment Scale	71	35-40	24 (5)	5	√	X	√	√	X	√	√	X	X	X
Condon (1993) Maternal Antenatal Attachment Scale	112	15 – T1 27 – T2 38 – T3 M = 32	19 (2)	5	√	X	√	X	X	X	√	X	X	√
Muller (1993) Prenatal Attachment Inventory	310	14 – 41 M =31.4	27 (5)	4	√	X	X	√	√	X	√	√	X	√
KEY: IR – Internal Reliability ER – External Reliability FV – Face Validity CV – Content Validity Conc – Concurrent validity Pred – Predictive validity Hom – Homogeneity (Internal consistency) Conv – Convergent validity Div – Divergent validity FA – Factor Analysis √ - Test performed X – Test Not done T - Trimester														

Siddiqui *et al.*, (1999) found the modified version of Muller's PAI to have a high internal consistency. However they questioned Muller's conclusion that maternal-fetal attachment was one-dimensional. They explored prenatal attachment in 171 Swedish women within their final trimester of pregnancy utilising a modified version of Muller's PAI and found that on factor analysis a five-factor solution emerged. This was replicated in research by Bielawska-Batorowicz and Siddiqui (2008) who found as a result of using Muller's PAI tool to investigate possible cultural differences in prenatal attachment between Swedish and Polish women that a five-dimensional model of maternal-fetal attachment emerged. Their results supported those of Siddiqui *et al.*, (1999), with the five factors identified as attributing traits; interaction; fantasy; sharing and affection. This supports the premise that maternal-fetal attachment is multi-dimensional. This was further espoused in Della Vedova *et al.*, (2008) study assessing the psychometric properties of the Italian version of Muller's PAI tool on 214 low risk pregnant women. From explorative factor analysis they found a five factor solution, accounting for 41.23% of the variance. The themes found as a result of item loading were similar to Siddiqui *et al.*, (1999), although they further stated that the themes were interwoven and interdependent. Gau & Lee (2003) investigated the validity of Muller's PAI tool,

finding that the PAI was reliable and valid. However it was criticised for its limited generalizability and for a failure to consider changes that may occur as pregnancy progresses. Della Vedova *et al.* (2008) also concluded that Muller's PAI was both reliable and valid

In conclusion the existing commonly used maternal-fetal attachment instruments have not been thoroughly tested for reliability and validity (Table 1). Criticisms range from lack of reliability due to an inadequate underpinning framework, to limited generalizability due to the sample, through to inconsistent and contradictory results. Muller (1992) acknowledges the need to produce further validated tools which will make measurement more robust; with most theorists agreeing that these should use as an underpinning paradigm a comprehensive definition drawn from the pregnant women's own perception of attachment. This study through mixed methodology intends to initially explore antenatal attachment utilising qualitative methods to discover from the pregnant women's own understanding a definition of attachment. This will be used as the framework for a maternal-fetal attachment tool. The tool will be improved and modified through validation by quantitative methodology. Data produced during

the two rounds of data collection for reliability and validity will be examined and related to the findings of the earlier qualitative findings which generated the definition, providing further scrutiny of the definition. The multi-dimensional and interrelated nature of attachment will be reflected through inclusion of psychological and psycho-social items within the questionnaire.

Methodology

Chapter Five Overview: Research Framework

The objective of this research is to make an original, systematic and well-founded contribution to the development of knowledge on maternal-fetal attachment. Creswell (2003) states that to determine the most appropriate framework for the subject under investigation three elements must be carefully considered - philosophical assumptions about the nature of knowledge; general research procedures or strategies of inquiry; and the detailed procedures of data collection, analyses and writing. There needs to be a match between the research problem and the approach utilised. The mixed methods approach has been used as a framework for this study. Tashakkori & Teddlie (1992) define studies that use the mixed method approach as a product of the pragmatist paradigm that successfully combines and integrates qualitative and quantitative approaches within the research process in order to facilitate full and rigorous exploration of the phenomenon under investigation. First employed by Campbell

& Fiske (1959) to study the validity of psychological traits, the mixed method approach used triangulation effectively to increase rigour and has become increasingly useful in the exploration of social sciences (Creswell, 2003).

Within the mixed methods approach the researcher bases the inquiry on the assumption that the collection of diverse types of data provides the best understanding of the research problem. Strategies of inquiry involve the approaches that will be most successful in finding the answer to the research problem. Data collection is pluralistic and involves gathering both qualitative and quantitative data (Creswell, 2003). The mixed methods approach has been used as the research design for this study as it has been identified by Creswell (2003) as the framework of choice for the development of an innovative psychometric instrument. This framework effectively combines the generation of a definition of maternal-fetal attachment and the production of a psychometric tool through qualitative exploration of pregnant women's subjective experience with quantitative testing on a wider and more diverse population.

Within research the philosophical assumptions or paradigms are defined by Guba & Lincoln (1994) as belief systems that guide and inform the research process. Within social sciences serious debates, or as Tashakkori & Teddlie (1995) describe them "wars", have raged regarding the superiority of the two

main paradigms quantitative (positivist / post-positivist) or qualitative (constructionist / phenomenological). Purists within each camp focus on conceptual issues such as the nature of reality and causal links. Tashakkori & Teddlie (1995) state that the debates raging on the differences between quantitative and qualitative have been tenuous and over-stated. From the incompatibility debates the paradigm of pragmatism was borne which presented a compatibility concept. Pragmatism rejects the dualism of the incompatibility debate, rejects the forced choice between research methods and embraces the benefits and diversity that result when both quantitative and qualitative methods are integrated.

Mixed methods promote the co-existence of the two main paradigms. Datta (1994) identified practical reasons for the co-existence and compatibility of the two methodologies. He states that both paradigms have been extensively used and therefore much is known about the paradigms. Many researchers have identified the effectiveness and value of combining both methodologies in providing rich and diverse data and distinct yet corroborating methods (Datta, 1994). This is supported by funding agencies that have applauded the increased rigour resulting from using both methodologies within a mixed methods design. The argument for mixed methods is further espoused by Reichardt & Rallis

(1994) who state that there are sufficient similarities in the fundamental values of quantitative and qualitative methods to "form an enduring partnership" (p.85). There are evident similarities between particularly post-positivist and constructionist paradigms. These include belief in the value of inquiry, belief in the theoretical underpinning of facts, belief that reality is multiple and constructed, belief in the fallibility of knowledge, and belief that any given data set can be explained by many theories. Therefore it can be argued that there are fundamental commonalities between the approaches that allow them to be used successfully together within a paradigm distinct from either post-positivism or constructivism, which has been labelled pragmatism. Pragmatism provides a philosophy that embraces mixed method design. It steers clear of the metaphysical concepts of truth and reality that cause endless and unresolved debate, and presents very practical solutions to research inquiry (Howe, 1988; Tashakkori & Teddlie, 1998). This realistic and unpretentious solution utilises and combines the most appropriate methods that will provide rigor to the research process and provide valid and reliable results.

The central concern of the pragmatism paradigm is the phenomenon to be investigated - the research problem. It is concerned primarily with application - what strategies work to provide solutions to the research problem (Patton,

1990). Instead of the method being important, it is the problem under investigation that is paramount. This permits the researcher freedom of choice with the acceptance that research occurs both within the natural sciences and the social, cultural and historical perspective of the individual (Cherryholmes, 1992; Williams, 2003). Thus allowing the researcher to focus on the problem and utilise pluralistic approaches to develop understanding and knowledge. Brewer & Hunt (1989) graphically describe this as allowing the researcher to "attack the research problem with an arsenal of methods" (p. 17). This vividly describes the increased rigour and freedom that a mixed methods design permits. The researcher is able to draw liberally from both quantitative and qualitative methodologies. It allows the researcher to choose the most appropriate methods, techniques and procedures which best meet the purpose of the research. Truth is what works at the time; it is not based on a strict dualism (Howe, 1988; Williams, 2003). Thus Creswell (2003) argues that for mixed method researchers both quantitative and qualitative methods should be used to complement each other as they have the potential to provide the best understanding of the problem under inquiry.

After consideration of the most appropriate method to tackle the research problem, the sequential approach within mixed methodology was deemed most

pertinent. The sequential exploratory approach allows continuing investigation of the research problem, providing elaboration and validation of the exploratory findings of the initial method (Creswell, 2003). It is the most pertinent design for testing quantitatively, on a different sample, an emergent theory resulting from qualitative investigation (Morse, 1991; Morgan, 1998). As such this model is particularly suitable for the development, construction and testing of a new instrument (Creswell, 1999). The nature of mixed methods does provide challenges as it necessitates extensive data collection, the need to become familiar with both qualitative and quantitative methodology and the need to analyse both text and numeric data. However the exploratory nature, the simple sequential approach to the development of original knowledge and the rigour involved with the triangulation of sources, make mixed methods an appropriate choice. As the sequential design is conducted in two discrete and clearly distinct phases it allows the researcher to present the paradigm assumptions behind each phase (Creswell, 1995; Tashakkori & Teddlie, 1998). However the sequential nature of data collection and analysis, with each phase emerging from and dependent upon the former, does mean that this model of inquiry is time-consuming and a lengthy process.

Within this research the qualitative phase initiated the process, as the

primary focus was to explore a phenomenon in order to develop a definition to underpin the production of a measuring tool. Both the definition and the measuring tool were further developed using quantitative methods to validate the instrument on a larger population, representative of the population under investigation. The findings of these two phases were then integrated and further considered during the interpretation stage (Creswell, 2003). This strategy is illustrated in Figure 2 below.

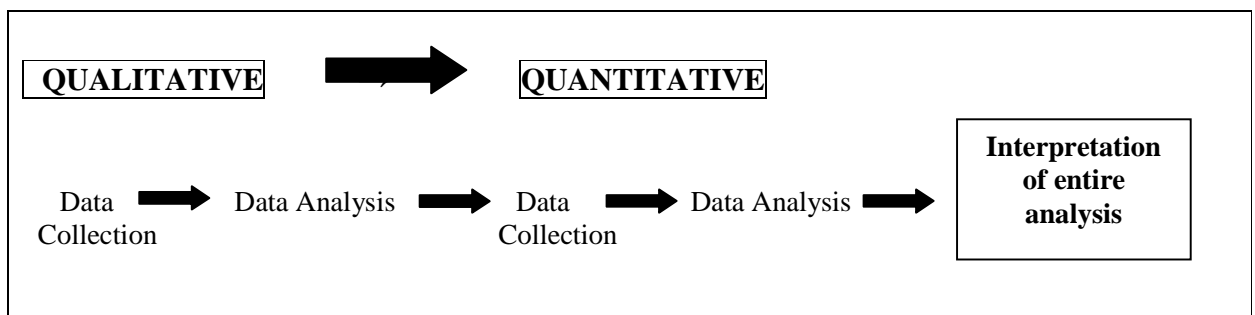


Figure 2 - Sequential Exploratory Strategy (Creswell, 2003, p. 213)

A further justification for the use of the mixed method design originates from the earlier critique of existing maternal-fetal attachment tools (Chapter 4). The most enduring criticism of existing maternal-fetal attachment tools is the lack of an underpinning theoretical framework to support and validate the instrument (Condon & Esuvaranathan, 1990; Siddiqui *et al.*, 1999; Zimmerman &

Doan, 2003). Muller (1992) suggests that the most effective theoretical framework would be generated from the pregnant woman's own perspective. Mixed methodology allows the qualitative exploration of the women's subjective experiences of attachment from which a definition can be generated to underpin the development of a psychometric tool measuring attachment. This tool can then be tested using quantitative strategies on a larger and representative sample of pregnant women to validate the instrument and further test the definition

Ethical considerations are complex when using a mixed methods design on a sample that is considered vulnerable. It is necessary to explore the specific issues evoked through the use of both qualitative and quantitative methods. Consideration must be given to both the unique issues that are involved within the collection of qualitative data and also the specific ethical issues involved with testing a psychometric tool. The ethical implications and considerations are discussed in Appendix One. Furthermore, pregnant women are considered a vulnerable group and as such any research involving this group must undergo scrutiny from external review. As a result this study needed to be examined and approval of the University Ethics Committee, the Local Research and Ethics Committee (LREC) and the Research and Development Unit (R&D) of the National

Sandie Sandbrook

Health Service Trust where data collection occurred. LREC approval can be found in Appendix Two.

Chapter Six

Phase One - Qualitative Research

Qualitative research is founded within the philosophy of socially constructed knowledge, the assumption being that humans seek understanding of the world they live in (Lincoln & Guba, 2000; Neuman, 2000; Schwandt, 2000). The aim of the qualitative research approach is to discover the meaning of the phenomenon under investigation from the participant's perspective. Qualitative research focuses on the meaning or reasons for specific behaviour rather than observation, it answers the questions "why", "what" and "how" (Lacey and Luff 2001). The philosophy emphasises the dependency of knowledge upon the individual's experience; meaning is not simply imposed it develops through continuing social interactions. Knowledge therefore is created within social networks and systems of socially composed meanings (Henwood & Pidgeon, 1995), developed through the individual's subjective interpretation based on their personal, social, cultural and historical experiences of life (Creswell, 2003). As humans interpret thoughts and emotions through their personal frame of reference it is essential if we are to make sense of behaviour that we need to discover how the world is perceived through the eyes of the individual experiencing the phenomenon under investigation (Denzin & Lincoln, 1994).

Qualitative researchers make three basic assumptions - that meanings are constructed by individuals as they engage with the world; that sense is made of the world based on the individual's historical and social perspective, thus meaning is bestowed by the culture we inhabit; and that arises in and through community interaction and experiences. Thus qualitative research involves specific processes - open ended questions are used to allow participants to express their personal views. Research occurs within the natural setting allowing the participant to feel relaxed, acknowledging the influences of the social / cultural environment. Research is always inductive; the researcher generates meaning from interpreting the data (Creswell, 2003). It requires the researcher's active involvement with the participant and the acknowledgement that understanding is constructed from and within a dynamic and complex social world (Tindall, 1999).

Design for Phase One

The aim of Phase One was to create a definition of maternal-fetal attachment, which will form the theoretical framework for the psychometric tool. Muller (1992) states that in order for the definition underpinning a maternal-fetal psychometric tool to have credibility and resonance it should be generated from the pregnant women's own experiences. Therefore two crucial points must be considered when choosing an appropriate design for

this phase of the research. Maternal-fetal attachment must be explored from the perceptual fields of pregnant women experiencing the phenomenon and a definition must be generated from the rich data collected from exploring the women's experiences and emotions. The design chosen to embrace these fundamental points was grounded theory.

Grounded theory evolved from the work of Glaser and Strauss (1967) who sought to develop an inductive method of research that would allow social theory to be generated systematically from data. The purpose was to take account of how the individual perceives reality to generate a theory that is "grounded" in the thorough, close and methodical analyses of data (Pidgeon and Henwood, 1998). The theory has evolved since its inception to mean a number of different things. Even the initial proponents have differing positions on the theory, with Strauss (1987) and Strauss and Corbin (1990) favouring a more phenomenological presentation of the approach (Chamberlain, 1995), the approach adopted for this research. Pidgeon and Henwood (1998) identify that today the term grounded theory has evolved to not only refer to theory grounded in qualitative data, but also to describe the method for the systematic analyses of unstructured data.

Grounded theory recognizes the subjective nature of reality, seeking to identify the crux of human behaviour through exploration of individual's lived experiences (Creswell, 2003; Probert, 2006). This necessitates purposive

sampling to recruit participants that have actively experienced the phenomenon or process under study. Data collection most commonly involves interviewing and focus groups. The objective being to encourage the participants to tell their story, in their own words, from their unique perceptual realities (Probert, 2006). The researcher is a listener who, through good communication skills enables the participant to give a detailed and accurate account of the lived experiences (Starks and Brown Trinidad, 2007). It is important that the researcher is aware of their preconceived thoughts and beliefs that may affect the analyses of the data. The researcher should engage in self-reflection or "bracketing", recognising and setting aside prior assumptions that could interfere with attending to the participants' account with an open mind (Polit and Hungler, 1995; Sokolowski, 2000; Gearing, 2004).

6.1: Part I - One to one interviews

Materials

Data collection was through face to face interviews, a method used to elicit personal and intimate views and opinions, producing a rich data source. An unstructured format to interviewing was chosen as this encourages the participant to give open-ended accounts of their thoughts, experiences and

opinions (Hayes, 2000). This interview method is concerned with finding meaning. The emphasis is on acquiring deep knowledge and authenticity of the individual's life experiences (Gubrium and Holstein, 2001). Maternal-fetal attachment is personal, intimate and emotional; the unstructured interview is an apt tool allowing the participant to tell their own story, often evoking deep disclosure (Johnson, 2001; Corbin and Morse, 2003). A further advantage of using the unstructured interview within this study is that flexibility afforded allows the interviewer to explore how the individual constructs maternal-fetal attachment, pursue emergent themes and gain new insights into the women's experiences (Corbin and Morse, 2003). In the unstructured interview the participants are active subjects and have the freedom to tell their story in their own way.

The potential depth of disclosure necessitates that the researcher is aware that within qualitative research they become part of the process and have a responsibility to equitably manage the research relationship and assure confidentiality. The unstructured interview is similar to a normal conversation, the researcher says as little as possible allowing the participant to tell their story and to maintain some control over the interview (Low, 2007). However no interview is totally devoid of structure, the conversation must be informed by the research question and the researcher may use a very simple schedule to ensure the conversation remains focused, although this

may not be used (McCracken, 1988). This flexibility allows the researcher to explore issues of interest introduced by the participant and the participant has the freedom to freely give their opinions.

The unstructured interview involves establishing trust and encouraging a high level of rapport to explore the views and motivations of the interviewee (Massarik, 1981). It is important that the interviewer develops interview skills to explore meaning and facilitate effective exchanges, encouraging the participant to speak openly without unduly influencing their opinions. Hayes (2000) highlights three skills as being imperative - "reflecting" repeating to the participant in different words what has just been said to confirm their opinion has been heard and understood; "amplifying" clarifying and broadening the scope of the interviewee's comments; and "non-committal agreement" encouraging the interviewee to continue talking without expressing the researcher's views. As unstructured interviews are often similar to normal conversations and led by the participant's experience it is important that they are audio-taped to capture the rich data produced.

As suggested by Burman (1999) a pilot interview was conducted prior to beginning the study. As a result of this interview the researcher learnt to listen carefully to the woman and not talk before the participant had finished her line of reasoning or to pre-empt her conclusions. A simple interview schedule was constructed that had the initial "grand tour" question and some

basic questions (Low, 2007) (Appendix Three). The interviews were however participant led, the schedule only referred to, in order to ensure that the interview remained focused on the research question.

Participants

The sample for the study consisted of ten women (Table 2, No. 2 - 11) in the third trimester of pregnancy (27 - 40 weeks gestation), five primigravid (pregnant for the first time) and five multiparous (had already borne a viable baby) women, selected on an opportunity basis from women attending a midwife led antenatal clinic at a General Practitioner Maternity Unit. The women were aged from 21 - 36 years old. Six were graduates; two-held work based professional qualifications and two-left school at 16 years of age. Seven of the participants were employed outside the home in professional capacities and three described themselves as housewives.

Participant 4 although multigravid (already been pregnant at least once) was for the purpose of the investigation considered a primigravida, as her first pregnancy was terminated at eight weeks gestation and this was therefore the first time that she had experienced a developing and viable pregnancy. Interviewee 1 did not form part of the study sample, with consent she was interviewed as a "pilot" to test and develop the researcher's skills in unstructured interview methods.

Table 2: Participant Demographic Information (Interviews)

<u>No.</u>	<u>Age</u>	<u>Parity</u>	<u>Gestation</u>	<u>Occupation</u>	<u>Full- time education -age left</u>	<u>Marital Status</u>	<u>How long in relationship</u>	<u>Type of housing</u>	<u>Pregnancy planned</u>
1	35	G3 P2	36 weeks	Housewife	16	Married	12 years	Owner occupier	NO
2	31	Primip	36 weeks	Physiotherapist	Graduate	Co-habiting	9 years	Owner occupier	NO
3	38	G4P3	34 weeks	Housewife	Graduate	Married	10 years	Owner occupiers	YES/NO
4	21	G2P0 (TOP) Primip	30 weeks	Housewife	16	Co-habiting	2 years	Rented	YES
5	31	Primip	34 weeks	Environmental Engineer	Graduate	Married	10 years	Owner occupier	YES
6	30	G2P1	27 weeks	Housewife	16	Co-habiting	7 years	Owner occupier	YES
7	39	G3P1 (misc)	Term	Aircraft Engineer	Graduate	Married	11 years	Rented	YES
8	30	G2P1	Term	Accountant	Graduate	Married	12 years	Owner occupier	YES
9	34	Primip	37 weeks	Journalist	Graduate	Married	3 years	Owner occupier	NO
10	29	Primip	32 weeks	Accountant	18	Married	10 years	Owner occupier	YES
11	36	G4P3	37 weeks	Midwife	18	Married	12 years	Owner occupier	NO

G = Gravida - pregnant P = Parity - viable baby born

Example - (No. 3 above) G4P3 = pregnant for the fourth time, with three viable children

Procedure

Primigravid and multiparous women within their final trimester of pregnancy were invited to participate in the study, following their routine antenatal examination at an antenatal clinic held at a Midwife-Led Unit. The venue was chosen due to the calm and unhurried environment and the availability of quiet and comfortable rooms in which to conduct the interviews confidentially. The setting for the research is important both to ensure a natural setting in which the participant feels comfortable and relaxed and also to ensure privacy, respecting the participant's dignity.

The study was explained to the women, together with the time it would take to complete and the need to audiotape the conversation. The women who wished to participate were then taken to a quiet and private room. They were then given a detailed Patient Information Sheet to read which gave an overview of the study; following this a consent form was given to them to sign if they wished to participate. Two women were interviewed within their own home as it was more convenient for them.

Following informed consent the audiotape was turned on and the interview commenced with personal details to categorise the women. The conversation was participant led and centred on the woman's thoughts and feelings about the pregnancy and developing fetus. The interviews were unstructured, a grand tour question was used to stimulate the participant's story with very basic prompts (Appendix Three) used only when necessary to stimulate further discussion. Each interview took approximately one hour.

Data Analyses

All interviews were audio taped and transcribed by the researcher. A copy of the transcript was given to the participant for verification, that as far as she could remember it was a true copy of the interview. This also allowed the women an opportunity to have any disclosure deleted if they wished. All of the participants were happy that as far as they could

remember the transcript was a true copy of the interview. None of the participants wanted any information deleted from the transcript.

Transcriptions of the interviews were then analysed manually by the researcher using the Glaser and Strauss (1967) constant comparative method.

Data analysis was iterative with data collection (Hayes 1998). Analysis proceeded systematically through eight stages (see Figure 3).

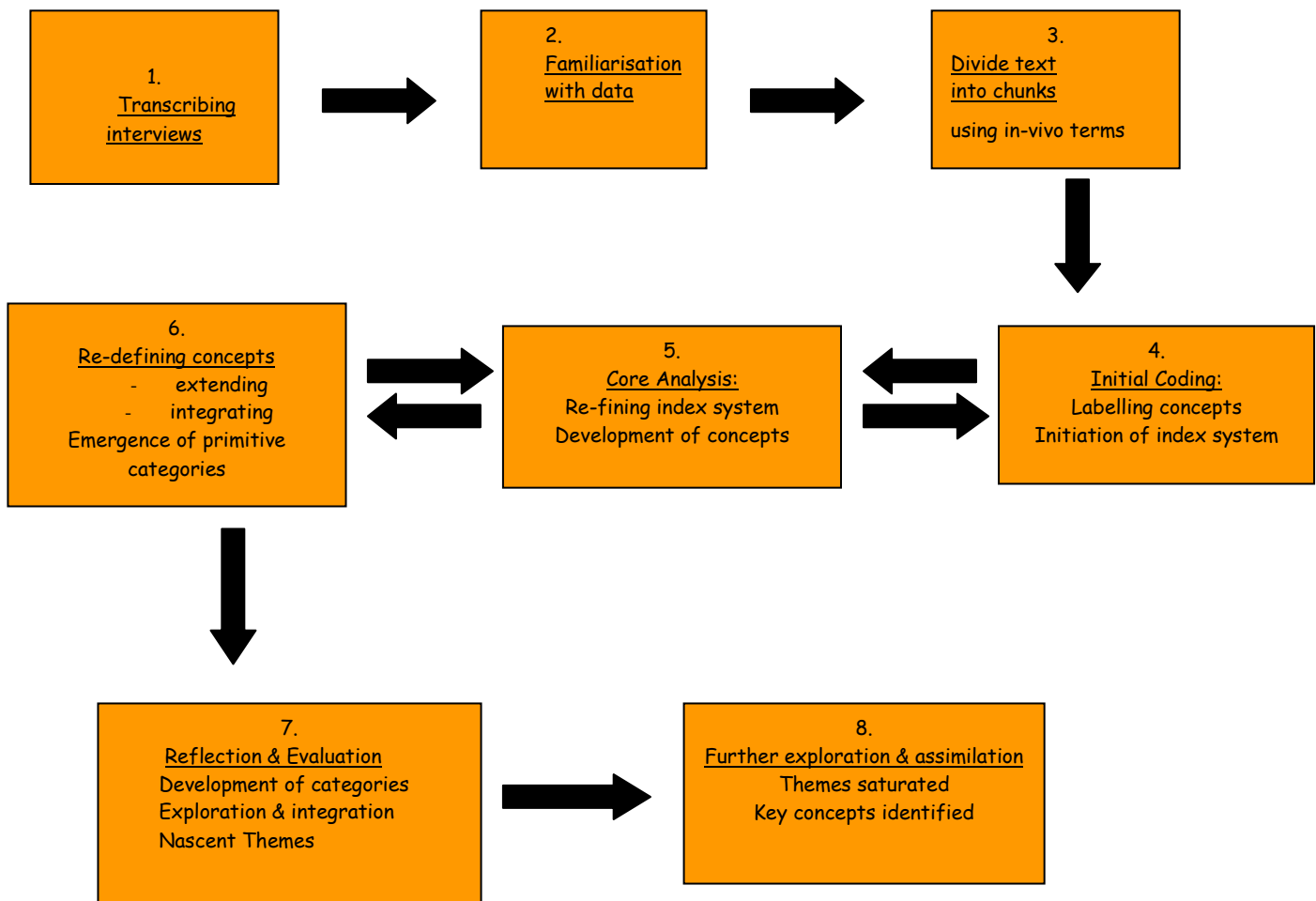


Figure 3: Stages in qualitative data analysis.

Each interview was independently transcribed and then read in order for the researcher to become familiar with data (Figure 3, stages 1 & 2). Facilitated by familiarisation the transcribed material was then broken down into chunks, each describing a separate idea or feeling, each was given in-vivo terms or descriptions (Figure 3, stage 3). The chunks were then open coded, each evolving concept was labelled in relation to context, meanings and circumstances and put on to card to form an initial indexed system (Figure 3, stage 4).

Once the stage of Initial Coding was reached the Index Systems was separated into two - primigravid women's responses and multiparous women's responses. Following Initial Coding of all transcribed interviews Core Analysis began independently on the two separate indexes, with re-defining of the index system and development of concepts (Figure 3, stage 5). With progressive conceptualisation, the analysis, integration and refinement of the data led to clusters of similar codes emerging to create primitive categories (Figure 3, stage 6). Primitive categories were then explored together, both primigravid and multiparous categories, looking for similarity and disparity leading to development and assimilation of the categories into nascent themes (Figure 3, stage 7). Conceptual saturation was reached when no new themes could be generated (Figure 3, stage 8), the data analyses having generated

the common and unique themes within the women's experience of antenatal attachment.

6.2: Part II - Focus Groups

Materials:

The literature is not explicit on what constitutes a focus group. It has been described as a small group of people representative of the research target group who are brought together to freely and spontaneously discuss the phenomena under investigation (van Teijlingen & Pitchforth, 2007). There does not appear to be any consensus as to the number of participants for an effective focus group, numbers within the literature varies from 5 - 15 (Polit & Hungler, 1995, Streiner & Norman, 1995, van Teijlingen & Pitchforth, 2007). In reality it would appear that the number chosen should reflect the purpose of the research, the expertise of the researcher, the availability of the participants, and favourable group dynamics. Corbetta (2003) suggests the group should include a large enough number to allow diversity of opinion, but a small enough group to allow the participants to feel comfortable interacting and sharing their opinions, particularly the quieter group members. The basic premise of focus groups is that the participants stimulate discussion and trigger ideas in each other - the group dynamics are therefore crucial (Kitzinger, 1994 (in van Teijlingen & Pitchforth, 2007, p. 78)). Focus groups

are a variant on the open-structured, depth interview and can be used to further explore and validate themes emerging from the one to one interviews. Corbetta (2003) suggests that the group dynamics within a focus group can uncover points not made in individual interviews and reveal an intensity of feeling which allows comparisons to be made on differing positions / views.

The collection of data from focus groups enables triangulation which will facilitate a richer data source and more valid interpretations. Data triangulation involves collecting data from different participants, in different positions and within different settings. This allows considerable extension and depth of data, with accounts from people in differing positions allowing investigation of a wider range of experiences in differing contexts (Tindall, 1999). Focus groups were used specifically to target particular groups in differing socio-economic settings, in an attempt to have a more representative sample. The three groups targeted were primigravid pregnant women, multiparous pregnant women and pregnant teenagers, each sampled from a different town. Data triangulation by extending the breadth and depth of data collection increases the credibility of the data and provides a basis for convergence on reality (Polit & Hungler, 1995). This credibility has been further enhanced by taking time to get to know the participants and through getting the participants to check the transcripts of interviews to ensure a true record has been made prior to analyses.

Focus groups are effective and flexible methods of data collection. Central to the process is the researcher or facilitator / moderator. It is imperative to select appropriate participants, a comfortable and favourable physical and psychological environment and to keep the discussion focused on the phenomenon under investigation. It is useful to recruit the group from pre-existing groups, as the participants already know each other. This will facilitate discussion and the group can be organised at a time and place they would normally meet up so as to disrupt the participants' life as little as possible (van Teijlingen & Pitchforth, 2007). It is important that there is good audio equipment to record the group discussion, so none of the data is lost (Peterson-Sweeney, 2005). Permission must be sought from the group to record their conversation and, following checking of the transcript by the participants, use excerpts within the research write-up to clarify points made. It is suggested that the researcher / facilitator explains their interest within the phenomenon under investigation and also identifies any appropriate professional qualifications that clarifies their position and expertise (Burman, 1999). This may facilitate discussion and allow the participants to approach the researcher with any concerns.

It is essential that the group negotiate ground rules to which they must all agree: it is important to emphasise that all discussions within the group are confidential and should not be shared with anyone outside the group; that

everyone's opinion should be respected, even if it is in conflict with their own; each person should be allowed to contribute; and only one person to speak at a time (van Teijlgen & Pitchforth, 2007). It is essential to adequately prepare the group - circular seating arrangements will allow all participants to see each other and facilitate equality, the participants should all be aware of the discussion topic, and all should have given informed consent. The facilitator should promote the free-flow of discussion with the use of open-ended questions, keep the conversation focused on the research topic, ensure that everyone makes a contribution and everyone's contribution is valued.

Each focus group was reported individually and then the findings further compared to produce themes that together with the findings from the one to one interviews were incorporated to produce a definition of pre-natal attachment that was used as the theoretical basis for the construction of a prenatal maternal-infant attachment score.

Focus Group 1: Primigravid women

Participants:

The group was a purposeful sample, chosen because they were primigravid / nulliparous, within their final trimester of pregnancy and from a different locality to the interview sample. As suggested by van Teijlgen & Pitchforth (2007) the women were recruited from a pre-existing group. The

women were all members of a parent-craft group from a neighbouring town, served by the Trust. They were experiencing their first viable pregnancy, were within the final trimester of pregnancy and had all got to know each other during the programme of parent-craft education offered by their community midwife. Eight women were asked if they would take part in a focus group to be held at the Midwife-Led Unit the following week, to discuss their feelings towards their pregnancy and "baby". All women consented to join the focus group; however two women birthed their babies prior to the event, so six women attended (Table 3). Their ages ranged from 23 to 37 years old, they were between 33 weeks pregnant to term. Three were graduates, two left school at 16 years old and the other left full-time education at 18 years old. All the participants had been actively trying to conceive. Four of the six participants planned to return to work.

Table 3 – Biographical information of participants in Focus Group 1

<u>Age</u>	<u>Gestation</u>	<u>Occupation</u>	<u>Full- time education -age left</u>	<u>Marital Status</u>	<u>Type of housing</u>	<u>Pregnancy planned</u>
34	38 weeks	School teacher/ Actor	Graduate	Married	Owner occupier	Yes
37	34 weeks	Office Manager	Graduate	Married	Owner occupier	Yes
20	Term	Office worker	18	Living together	Renting	Yes
35	37 weeks	Accountant	Graduate	Married	Owner occupier	Yes
30	38 weeks	Clerical	16	Married	Renting	Yes
24	33 weeks	Sales Consultant	16	Living together	Renting	Yes

Procedure:

The six women attended the Midwife-Led Unit on the designated day. The venue was chosen for its convenience for all participants and the availability of a warm, comfortable and private sitting room for discussion. Prior to the women attending the comfy chairs had been arranged into a circle, around a large dining table; tea, coffee and muffins were provided. The women were greeted and once everyone was in attendance the purpose of the focus group was again explained. The researcher explained her interest within the discussion topic and that she was a Midwife Teacher of many years experience. Permission was also sought to audio-tape the group discussion and use excerpts for the write-up, following viewing of the transcript. Each participant was given an information sheet to supplement the explanation and provide the contact details of the researcher, should they have any queries or worries following the focus group. Prior to participation each member of the focus group signed a consent form. The ground rules were negotiated and discussed. The recorder was switched on and following a further brief explanation to focus the group the discussions commenced. A flexible interview schedule was used, and discussions initiated and maintained as appropriate with open questions. The atmosphere was congenial, everyone contributed to the discussions and the researcher kept the conversation

focused. The interview lasted a little over an hour and produced valuable data.

Focus Group 2: Multiparous women

Participants:

A purposeful sample was selected, multiparous women, within their last trimester of pregnancy and living within easy travelling distance of the selected venue. It was difficult to access pre-existing groups that a representative range of multiparous women would access, initially "mother and toddler" groups were investigated but these were attended mainly by non-working mothers, limiting the sample. So women attending for routine antenatal care at the Midwife-Led Maternity Unit, were asked if they would attend a focus group to discuss their feelings towards their developing "baby" on a specified date a week later, the request was supplemented with an information sheet explaining the study. Seven women assented and subsequently attended, 4 had planned their pregnancies, 2 pregnancies were a shock and 2 were not entirely unplanned, not using contraception consistently. Ages ranged from 25 to 40 years old, all were in co-habiting relationships. 3 women were pregnant with their second child, 3 were pregnant with their third child and 1 expecting her fourth child (Table 4).

Table 4: Biographical details of participants in Focus Group 2

<u>Age</u>	<u>Parity</u>	<u>Gestation</u>	<u>Occupation</u>	<u>Full- time education -age left</u>	<u>Type of housing</u>	<u>Marital status</u>	<u>Pregnancy planned</u>
24	G2 P1	33 weeks	Sales Assistant	16	Rented	Living together	YES
27	G3 P2	32 weeks	Housewife	Graduate	Owner occupier	Married	YES
40	G3P1 (misc)	Term	Architect	Graduate	Rented	Living together	YES
35	G3 P2	34 weeks	University Lecturer	Graduate	Owner occupier	Married	YES
25	G2P1	36 weeks	Pharmacy technician	18	Owner occupier	Married	NO
36	G3 P2	38 weeks	Housewife	16	Owner occupier	Married	NO
36	G4P3	36 weeks	Nurse	18	Owner occupier	Married	NO

Procedure:

The focus group was held mid-morning at the Midwife-Led Unit, which had been negotiated as the most convenient time. The Midwife-Led Unit had an unhurried, calm atmosphere and had been decorated in a "home from home" style to encourage informality and comfort. The chairs were arranged around a large dining table and refreshments provided. Unfortunately not all the participants were known to each other, therefore introductions were made and ice-breakers utilised to promote familiarity and psychological comfort within the environment. The purpose of the group was explained, the information sheet was discussed, and the researcher's interest and professional expertise stated. The women were asked permission to audio-tape their conversations. The interview started with open-questions to stimulate conversation and the discussions flowed. The facilitator ensured

the conversation remained focused and the women appeared to enjoy sharing their experiences. The discussion lasted approximately an hour and produced some interesting and rich data. Some women were new to the area and found the group had initiated a network of contacts, which was difficult to start when you only see women at antenatal clinic.

Focus Group 3: Pregnant teenagers

Participants:

The youngest woman who participated within the interviews (Part 1) was 20 years old. Although the age range interviewed is representative of the childbearing population, it did not take into account the views and opinions of pregnant teenagers. To address this it was decided to conduct a specific focus group with teenagers. Teenagers are unlikely to access parent-craft sessions and from observation want to get through antenatal clinic visits as quickly and unobtrusively as possible (Hutchinson, 2007). It was more difficult to gain access to this group. Within maternity care teenagers are a problematic group to access, their use of the service is not optimum and they often feel alienated by the older expectant women and society's general attitude of disapproval of pregnancy in the teenage years. This disapproval is embodied within government targets to reduce the teenage birth rate which further isolates and disaffects pregnant teenagers (Hutchinson, 2007). This

government initiative has highlighted the personal, social, educational and health difficulties experienced by pregnant teenagers and as a result projects have been set up to improve and better target services for teenagers (DfES/DoH, 2004). It was decided that the most appropriate way to set up a teenage focus group was to attend and get to know pregnant teenagers at a specialist support group run by a community midwife and health visitor in a neighbouring town that has a high incidence of teenage pregnancies. I discussed my research with the community midwife, who after discussing the research with the group and gaining their consent invited me along to a support group meeting. The group was very informal and opportunities were taken for health promotion and teaching of parenting skills, support was offered both antenatally and postnatally. Unfortunately there were not large numbers attending. I discussed the purpose of the research and some of the teenagers stated they would like to take part. Information sheets were given out and an appointment made to interview them over lunch the following week.

Four teenagers attended, 2 were in their second trimester of pregnancy and two were in the third trimester of pregnancy. Strict interpretation suggests that this is too few participants to be considered a focus group (Polit & Hungler, 1995, Streiner & Norman, 1995, van Teijlingen & Pitchforth, 2007). However, access is difficult to this particular group. It is also

difficult to engage individual teenagers on the sensitive issue of their pregnancy. However within a small trusted group conversation is deflected from the individual experience and discussion can be more effective. The girls had got to know each other and their carers over time and felt comfortable to discuss their emotions towards pregnancy and the growing fetus within the confines of the support group. Some of the matters discussed within the focus group were extremely confidential and the teenagers needed to know that these intimate and private details could be shared safely. Their ages ranged from 14 - 17 years old, three were pregnant for the first time and the fourth had experienced a termination of pregnancy when she was 14 years old (Table 5).

Table 5 - Biographical details of participants in Focus Group 3 (Teenagers)

<u>Age</u>	<u>Parity</u>	<u>Gestation</u>	<u>Education</u>	<u>Social support</u>	<u>Relationship with father</u>	<u>Pregnancy planned</u>	<u>? Bullied</u>
14	G1	18weeks	Home tuition	Mother. Parents separated	Boyfriend in prison for drug offences	No	Yes
15	G2 TOP	20 weeks	School	Father & Step-mother	Supportive boyfriend, hoping to move in together	?Yes	No
15	G1	28 weeks	School	Parents	None	No	Yes
16	G1	Term	College	Parents & Boyfriend	Supportive Have been given a rented flat they're moving in together	No	Yes

Key: G = Gravida (number of times pregnant e.g. G1 = first pregnancy); TOP = Termination of pregnancy.

Two of the girls were in supportive relationships, hoping to live with the father of their baby; the boyfriend of one was in prison for drug offences and for the other teenager the pregnancy was the result of a casual sexual encounter. The three adolescents within relationships were all with men between 20 and 23 years old. The families following a period of shock and disappointment were supporting the adolescents. All the teenagers intended to keep their babies. A point of note is that 3 of the 4 participants had suffered bullying at school.

Chapter Seven

Results

7.1: Data Analyses: Interviews

Initially data collection and analysis progressed in chorus, with concepts identified through data analysis. Due to the opportunity nature of participant sampling each interview was transcribed, familiarised, "chunked" and open-coded into pertinent concepts as they occurred (Stages in data analyses discussed on p.110). Consequently the raw data from primiparous and multiparous women were initially not analysed separately but expediently and conveniently as interviews occurred. However during initial coding two separate index sets were produced as it was originally postulated that these two groups may have very different perceptions and experiences of attachment and therefore data must remain separate so as not to contaminate or dilute possible inherent differences.

Table 6 shows the concepts that were labelled from the primiparous women's transcribed interviews, each concept were coded with P (Primigravid) and a number assigned to ease identification and analysis. For example P.21 labelled *Anomaly Screening* contained the thoughts reactions and subsequent decisions about screening tests for fetal abnormality.

Table 6: Initial Coding – Concepts identified by Primigravid participants

No.	Concept	No.	Concept	No	Concept
*P1	Effect of pregnancy on self	P22	Early pregnancy feelings	P42	Breast feeding
P2	Body image	P23	Pregnancy an intimate secret	P43	Attachment developmental
P3	Effects of pregnancy on self concept	P24	Fetus first perceived as a "baby"	P44	Feeding
P4	Pregnancy life changing	P25	Effects of first USS	P45	Explanation of attachment
P5	Positive partners reactions	P26	Parenting	P46	Close = Attachment
P6	Positive behavioural signs of attachment	P27	(a & b) Parental involvement	P47	Looking forward to seeing baby
P7	(a & b) Protection	P28	Intergenerational attachment	P48	Fetus belongs to woman
P8	Negative partner reactions	P29	Desired children	P49	Effect of previous TOP
P9	Effects on relationship	P30	Pregnancy planned	P50	Reactions to possible anomaly
P10	Pregnancy not as expected	P31	Effects of gender of fetus	P51	Feelings re: TOP
P11	Fear of miscarriage	P32	Discovery of pregnancy	P52	Conformity to perceived social norms
P12	Reactions to fetal movements	P33	Pregnancy not planned	P53	Ambivalent feelings first trimester
P13	Woman's expectations of partner	P34	Nesting instinct	P54	Perceived infertility and effects
P14	Apportioning characteristics to fetus	P35	Thoughts on labour	P55	Baby
P15	Pregnancy generally enjoyable	P36	Partners lack of joy & effects	P56	Positive relationship with partner
P16	Positively interacting with fetus	P37	Baby as a bargaining tool	P57	Remains unsure of parenthood
P17	Need to see/hold fetus to fall in love	P38	Concerns re: ability to "bond"	P58	Unsure of partners commitment
P18	Fear of congenital abnormality	P39	Woman's negative feelings & actions	P59	Practical preparations for parenting
P19	Baby described as "ours"	P40	Perception of being "in-tune" with pregnancy	P60	Grieving for loss of freedom
P20	Pregnancy and society	P41	Attempts to define feelings towards fetus	P61	Desire to have body back
P21	Antenatal anomaly screening				

(* = Primigravid)

Table 7 presents the concepts that were identified from the interviews of the multiparous women. Each concept was coded with M and given a number to identify it to assist further analysis. For example M60 records the women's *Initial Emotional Reactions* on discovering the pregnancy. This includes both the positive joyous reactions and the negative emotions experienced by some of the women who were not planning or indeed wanting a further pregnancy.

Table 7: Initial coding - Concepts identified by Multiparous participants

No.	Concept	No.	Concept	No.	Concept
*M1	Effects of proposed Termination of Pregnancy (TOP)	M24	Rationale for pregnancy	M47	Protection (a & b)
M2	Better prepared for parenting	M25	Negative partner reaction to pregnancy	M48	Women's perceptions of men's attachment
M3	Effects of existing child with Congenital anomaly	M26	Pregnancy an intimate secret	M49	Baby MINE - unique relationship
M4	Threat of TOP - early pregnancy	M27	Work outside the home	M50	Fetal movements
M5	Attachment - developmental	M28	Ultra-sound Scan (USS)	M51	Maternal-fetal communications
M6	When pregnancy becomes a "baby"	M29	? Terminate if fetal anomaly detected	M52	Baby described as OURS
M7	Effects of previous childbearing experience	M30	Anomaly screening	M53	Birth
M8	Plans for further children	M31	Feelings of ACCEPTANCE with this pregnancy	M54	Reactions of other siblings
M9	Effects of existing children on pregnancy	M32	Feelings of being "in-tune" with fetus	M55	Baby once born
M10	Nesting instinct	M33	Positive life-style changes	M56	Fetus diagnosed as HAVING anomaly
M11	Attempts to promote partners bonding	M34	This pregnancy SPECIAL	M57	Reactions at discovery of pregnancy
M12	New relationship - his first child	M35	Early pregnancy	M58	Information seeking
M13	Effects of relationship on Attachment	M36	This pregnancy must "fit-in"	M59	Experiences and/or knowledge causing anxiety
M14	Attachment of other siblings	M37	NOT having any more children	M60	Initial emotional reactions
M15	Artificial feeding	M38	Perceptions of pregnancy	M61	Pregnancy planned and desired
M16	Concerns with attachment to this baby	M39	Becoming a mother life changing	M62	Positive partner reactions
M17	Natural birth / medicine	M40	Changes to emotions	M63	Partner providing emotional support
M18	Concerned Postnatal Depression may return	M41	Fear of miscarriage or stillbirth	M64	Partner providing practical support
M19	Effects of previous miscarriage	M42	Continuing fear for viability of pregnancy	M65	Parental involvement
M20	Pregnancy NOT planned	M43	Body image / Self-esteem	M66	Relationship with parents
M21	Negative relationship with partner	M44	Apportioning characteristics to fetus	M67	Positive relationship with mother
M22	Happy to be pregnant	M45	Effect of gender of fetus	M68	Parenting
M23	Close = Attachment	M46	Words related to feelings toward fetus	P49	Effects of previous TOP

(* = Multiparous)

Analysis then progressed independently, exploring each index set separately to refine the index system and produce primitive categories.

Primigravid Women

Core analysis (Figure 3, stage 5) followed initial coding. On further examination using constant comparative strategies concepts were re-defined or incorporated into existing concepts, e.g. P (Primigravid) 41 *"attempts to define feelings towards fetus"* and P43 *"attachment developmental"* was integrated into P45 *"explanation of attachment"*. The concepts were explored, definitions given and constantly compared and integrated until clusters of similar codes began to emerge creating primitive categories (Figure 3, stage 6). Once incorporated into a category the individual concept cards were tied together to form a set. During this stage certain concepts appeared flawed, neither causal nor challenging to the emerging themes and were as a consequence discarded (P35, 42 and 44). Eight primitive themes emerged and were defined (Table 8),

Three themes appeared pervasive and important within the women's perceptions and experiences of attachment - protection, the developmental nature of attachment and the influence of the partner. Protection and progressive development appeared to be the essential characteristics that were fundamental within the women's experience of attachment and were therefore integrated into a theme of definition. The partner's reactions and support whether positive or negative was described as important, either having an intrinsic effect on the woman's perception of both herself and the

pregnancy. This was considered causal within attachment and included as a single category.

Table 8: Primitive themes - Primigravid participants

No.	Primitive Themes
1	<p><u>DEFINITION</u> Two major themes emerging: PROTECTION & DEVELOPMENT</p>
2	<p><u>POSITIVE SIGNS OF ATTACHMENT</u> Includes behavioural and emotional signs Considers when fetus first described as a "baby"</p>
3	<p><u>FRAGILE PREGNANCY</u> Explores early pregnancy feelings and fears Includes early feelings of ambivalence</p>
4	<p><u>PARTNER</u> Reactions of partner Support offered</p>
5	<p><u>PREGNANCY</u> Positive and Negative Aspects Effects on self-esteem</p>
6	<p><u>INTERGENERATIONAL ATTACHMENT</u> Effects of attachment to parents Parental support</p>
7	<p><u>SOCIETY & CHILDBEARING</u> Perceived expectations and conformity Includes perceptions and plans for parenting</p>
8	<p><u>EFFECT OF FETAL GENDER</u> Strong desire to give birth to a specific gender</p>

Multiparous Women

Following initial coding 68 concepts were labelled (Table 7). On review a concept identified by a woman that for the purpose of the study was classified as primiparous (she had previously had a social termination in her first pregnancy at eight weeks gestation, consequently this is her only experience of nurturing a developing pregnancy) was included within the experiences of multiparous women as she identified *"the effects of previous termination of pregnancy"* on her attitude to her current experience. As core analysis (Figure 3, stage 5) progressed concepts were integrated, e.g. M (Multiparous) 22 *"happy to be pregnant"* was merged into M60 *"initial emotional reactions to pregnancy"*. In the course of refining, extending and integrating concepts five labelled concepts were abandoned as they detracted from the focus of attachment (M8, 15, 17, 27 and 37). Nine primitive themes materialized and were defined and tied together into sets (Table 9).

As identified by primigravid women three themes were again ubiquitous, re-appearing consistently within the discourses - these were protection, attachment as a progressive developmental process and the pervasive effects of the partner's support. A decision was made to separate the themes of protection and developmental attachment, as on further exploration within the contexts used they appeared essentially different in focus - protection

describing an overwhelming innate emotion and developmental attachment

describing an emotional reaction to environmental and physical experiences.

Table 9: Primitive themes – Multiparous participants

No.	Primitive themes
1	<u>PROTECTION</u> Prevalent emotion identified
2	<u>ATTACHMENT IS DEVELOPMENTAL</u> Attachment grows throughout pregnancy and is affected by specific events, that demonstrate fetal growth and well-being
3	<u>PARTNERS</u> Positive and negative reactions of partners Support offered
4	<u>PREGNANCY</u> Positive and negative aspects 3 out of 5 women described this pregnancy as SPECIAL
5	<u>INTERGENERATIONAL ATTACHMENT</u> Quality of attachment to parents Parental support
6	<u>EFFECT OF FETAL GENDER</u> Strong desire to give birth to a specific gender
7	<u>PREVIOUS CHILDBEARING EXPERIENCE</u> How previous experiences affect perception and subsequent choices within the current pregnancy
8	<u>POSITIVE DIAGNOSIS OF FETAL ANOMALY</u> Affect this has on perception and emotional response to pregnancy
9	<u>EFFECT OF EXISTING CHILDREN</u> Pregnancy must now "fit in" with family commitments Concern re: ability to attach to another child

Integration of primitive themes primigravid and multiparous women to produce nascent themes (Figure 3, step 7)

The themes for primigravid and multiparous women were integrated following further comparison and investigation for cohesion and variety. It was necessary to re-examine all identified categories, to look again at the concepts within each set to identify whether similarly titled categories contained interrelated or incongruent data on attachment. As a result categories were refined, sub-divided and assimilated to produce thirteen nascent themes (Table 10). One multiparous category was abandoned as it related to specific incidents of complications "*Positive diagnosis of anomaly*", which could not be generalised to a normal pregnancy experience and was therefore for the intention of this study invalid. This is supported by Grace (1984) whose empirical study found that women at risk of delivering an abnormal child appeared to experience the fetus in a unique and differing way to those women having a normal pregnancy.

Thirteen Key Concepts / Themes, relating to women's feelings towards the fetus and the pregnancy, were identified following extensive review and constant comparison (Table 10). Nine themes were common to both primigravid and multiparous women. One theme was specific to primigravid women - the novelty of prospective parenthood led to concerns being expressed regarding their ability to parent successfully and possible effects

on the couple's relationship. Two themes were exclusive to multiparous women - although the wonder of pregnancy remained it was described as *"a normal/ everyday event"* (Interviewee 3), *"...a fact of life"* (Interviewee 7). Previous experiences during childbearing also affected their response to the current pregnancy *"... there's still a chance that I could lose this one too, so I'll just play it cool"* (Interviewee 7).

Table 10: Key concepts for primigravid & multiparous participants

Themes Specific to Primigravid Women	Common Themes	Themes Specific to Multiparous Women
13. UNCERTAIN OF ABILITY TO PARENT	1. PROTECTION	6 EFFECTS OF EXISTING CHILDREN / FAMILY ON CHILDBEARING
	2. ATTACHMENT IS A DEVELOPMENTAL PROCESS	
	3. EARLY PREGNANCY FEARS ↓	
	4. AMBIVALENCE OF EARLY PREGNANCY	
	5 PREGNANCY EMOTIONS & BEHAVIOURS	
	7. BEHAVIOURAL SIGNS OF ATTACHMENT	
	8. SUPPORTIVE PARTNERS	12. EXPERIENCE OF POOR OUTCOMES CAUSING ANXIETY
	9. PREGNANCY UNPLANNED & UNWANTED BY PARTNER	
	10. PARENTAL SUPPORT, EFFECTS ON PREGNANCY & PARENTING	
	11. EFFECT OF FETAL GENDER	

The overwhelming response to how women felt about the fetus was **protective** *"I feel very, very protective"* (Interviewee 4, primigravida), *"I feel very protective ... I don't like being in big crowds"* (Interviewee 6 multiparous woman). This appears to be an innate, natural reaction and appears as soon as the pregnancy is discovered becoming more intense if the pregnancy was threatened - Interviewee 3 a multiparous woman with a pregnancy that was unplanned and unwanted by her partner *"I was trying to protect this baby from the beginning ... I was trying to defend its life"*. The fetus was perceived as belonging to the woman, a precious gift to be nurtured. The woman must protect her progeny from environmental damage, accidental harm and perceived dangers.

Attachment as a developmental process was separated out as a distinct theme. It would appear that attachment as well as an instinctive response was an emotion and behaviour that developed in response to internal and external stimuli *"As the pregnancy develops the stronger the heart gets ... and it becomes more precious"* (Interviewee 2, primigravida); discussing ultrasound scan (USS) at 13 weeks gestation *"that brought it home that it was real ... 'cause it actually looked like a little baby"* (Interviewee 6, multiparous woman). It appeared that the fetus was initially perceived as a hope that becomes real as pregnancy progressed and produced evidence of fetal viability. This evidence of viability results from the woman's own

experiences of fetal movements and the growing maternal abdomen. It also resulted from technical evidence of ultrasound visualisation of fetus and through hearing the fetal heartbeat with a sonic-aid. Within the study most women stated that they would only truly fall in love with the fetus when they could hold the baby in their arms, see, touch and talk to it as a person.

Issues within pregnancy were explored for both primigravid and multiparous women and certain common themes were identified. For all women there were real concerns regarding the early viability of the fetus. The women were concerned about the possibility of miscarriage *"when you plan it ... you want a baby at the end, you don't want to miscarry"* (Interviewee 6, multipara). Screening tests for fetal anomaly and the prospect of termination exacerbated this fear - Interviewee 9, a primigravid woman had an amniocentesis for suspected Down's syndrome, of awaiting the results she said, *"... you're desperately trying to detach and thinking I must be strong"*. The theme **early pregnancy fears** is defined as a period of great concern when the women are afraid to devote too much emotional investment in a pregnancy that may for a variety of reasons be an unviable proposition. This theme links with **ambivalence of early pregnancy**, concerns regarding the viability of pregnancy coincide with general feelings of frailty that characterise the first twelve weeks of pregnancy; Interviewee 10 a primigravid woman stated *"I was on the phone to the midwife crying saying*

should I feel this tired, I just want to sleep on my desk." Diagnosis of pregnancy, made when there is no tangible physical proof, is often greeted with disbelief; most women did not feel pregnant just depleted by the "minor ailments" of early pregnancy.

The theme **behavioural signs of attachment** were common to both groups of women, these were tangible signs that women had changed their behaviours to ensure a favourable intra-uterine environment and actively seek knowledge pertinent to their experience of pregnancy. This included changing life-style "from the twelve week scan I really thought there is a life in there ... you'd better stop drinking, going out clubbing..." (Interviewee 2, primigravida), information seeking "I've read up on the birth, I've no strong feelings but I want to be well informed so I can make informed choices" (Interviewee 5, primigravida) and positively interacting /communicating with the fetus "You talk to it and rub it and ... if it gets agitated you can, sort of, calm it down" (Interviewee 8, multipara). It was assumed that multiparous women would already have a personal experience of pregnancy and therefore be less inclined to seek information. From the interviews this was found to be incorrect. The women often did search for information but information seeking was more focused, searching for a solution to a previous experience "...this time I'm trying to find out a bit more about it (labour) you're never

prepared for the first one, but now I know more, I know to ask more questions" (Interviewee 7, multipara).

The primitive category of "partners" on revision needed to be divided into positive and negative themes. **Supportive partners** had very constructive effects on their partner's self-esteem and relationship with the fetus.

Pregnancy was viewed as a joint venture - planned together and mutually overwhelmed when the discovery was made "*... he was so excited...*"

(Interviewee 4, primigravida). Often in early pregnancy the couple elected to keep the pregnancy an "*intimate secret*" (Interviewees 7, 10 & 11). Support was practical and emotional, with the partner becoming more "*protective*" (Interviewees 5.6.7 & 11) and becoming actively involved in decision-making.

Within Part 1 both a primigravid woman and a multiparous woman had partners for whom the **pregnancy was unplanned and unwanted**. These men were not involved in the decision to parent and were angry or dispassionate when informed. Both women prevaricated about revealing the positive pregnancy diagnosis, fearing the response from their partners. Interviewee 3, a multiparous woman pregnant with her fourth child waited until she was twelve weeks pregnant before informing her partner. Both couples discussed termination of pregnancy; in both cases the women were adamant that this was unacceptable. The women both stated that they felt "*very isolated and alone*". Interviewee 9 viewed her baby as causal in her deteriorating marital

relationship and feared that as a result she would be unable to attach to her baby *"...this baby has opened a can of worms"*.

Both groups highlighted the influence of parents on their current situation. Primitive categories of "intergenerational effects" and "parenting" were revised, compared and integrated. Most women stated they were *"close"* to their mothers. This positive relationship was valued and in one case the woman's mother was her sole support for pregnancy. Interviewee 7 stated that she desired a girl to emulate the relationship she has with her mother, she had suffered an earlier miscarriage and it was her mothers' support during this difficult time that she found most beneficial *"... my mom was with me she was great ...it was nice having her around, especially when you don't really know what's happening"*. In most cases the parents were the first people following the couple to be informed of the pregnancy. Parents were also fundamental within decisions regarding parenting styles - conclusions were reached both to imitate good practices and to reject perceived bad practices *"she was seen as the disciplinarian ... if she sent us to bed for being naughty ... my dad would fetch us down ... I said to my husband whoever tells them off and sends them to bed is the one that gets them down."*

The final common theme was the **effects of fetal gender**. This theme whilst comparatively small appeared important to both primigravid and multiparous women in the desire for the pregnancy. Some of the women

yearned for a particular gender "*I'm desperate for a girl*" (Interviewee 7) and had preconceived ideas about their partner's wishes "*It's going to be a boy ... it'll please Matt for sure*" (Interviewee 6). Although in the majority of cases there was a preference for a particular gender, all state that once the baby arrived, following perhaps initial disappointment they would be content that hopefully the baby is healthy. Of interest is that both women whose partners had rejected the pregnancy believe that the baby's gender had a great impact and could influence ultimate acceptance.

7.2: Data Analyses: Focus Groups

Focus Group 1: Primigravidae

Following initial coding 34 concepts were identified (Table 11). During core analyses one concept "Pregnancy is a normal life event" (N15) was rejected as unrepresentative of the participants' general feelings towards their pregnancy. One participant had endured three years of infertility and was awaiting treatment when she discovered her pregnancy. This pregnancy far from being a normal life event was very precious and she constantly demonstrated anxiety regarding the viability of the fetus. Fourteen primitive categories emerged (Table 12).

Table 11: Initial Coding: Concepts identified by primiparous participants (Focus Group 1).

No	Concept	No	Concept	No	Concept
N1	Pregnancy planned	N13	Ultra sound scan	N25	Women's perception of partner's attachment
N2	Reproductive failure	N14	Men participating in pregnancy	N26	Disappointment at partner's reaction to pregnancy confirmation
N3	Pregnancy shared	N15	Pregnancy a normal life event	N27	Feels close to partner
N4	Parental involvement	N16	Life-style changes	N28	Parenting
N5	Reaction to discovery of pregnancy	N17	Body image	N29	Perception of being "old" for first time mother
N6	Pregnancy special	N18	Emotional changes	N30	Concern for ability to attach
N7	Tentative pregnancy	N19	Fetal movements	N31	Partner help with childcare
N8	Fear of miscarriage	N20	Communication with fetus	N32	Parenting life changing
N9	Feeling ill first twelve weeks	N21	Intimacy of dyad	N33	Concern that women may take over childcare
N10	Antenatal screening	N22	Fetus first thought of as a person	N34	Qualities of a good parent
N11	Anxiety	N23	Giving characteristics to fetus		
N12	Termination for abnormality	N24	Emotional reactions to fetus		

Table 12: Core Analysis: Formation of Primitive categories. (Focus Group 1)

Pregnancy shared & special N1, 3, 6, & 27	Tentative pregnancy N2, 7 & 8	Partner's involvement N14 & 31
Protective behaviours N12, 16 & 24 <i>"sense of responsibility & protection"</i>	Gestation of a person N22 & 23	Physical & emotional adaptation to pregnancy N9, 17 & 18
Partner's detached - vicarious parenting N25 & 26	Intimacy of pregnancy N5, 19, 20 & 21	Intergenerational parenting N4, 28 & 34
Anxiety N11, 29 & 30	Women concerned may take over childcare N33	Parenting life-changing N32
Ultra-sound scans N13	Antenatal screening N10	

Categories were systematically refined, correlated and extended to more closely fit the data (Descombe 1998). Primitive categories were methodically integrated and merged until six distinct and autonomous key concepts emerged that closely fitted the data (Table 13). During this phase memos were written to identify rationale for revisions and category integration.

Table 13: Key concepts for participants in Focus Group 1

No.	Nascent themes
1	Tentative pregnancy and concern for abilities to mother
2	Protection
3	Intimacy of pregnancy - mother & fetus dyad
4	Pregnancy shared - partner support
5	Intergenerational influence
6	Physical & emotional adaptation to pregnancy

All themes were enduring throughout the dialogue. Significant within the themes is the notion of the **intimacy of pregnancy**, shared quintessentially by the woman and her fetus. This special relationship results in the fundamental need to take responsibility and to **protect** the life within. Central to the ability to provide protection is **partner support**, engendered by the key assertion that their pregnancies are shared by their partners. For two women within this group, fear caused by previous reproductive failures resulted in a phenomenon described by Kath Rothman (1986) as a **tentative pregnancy** - a pregnancy much desired but fear of loss results in differing levels of anxiety.

Fundamental is the theme **intimacy of pregnancy** which describes the exclusivity of the relationship between the woman and her fetus, which is described by one participant as *"almost sensual"*. It is described by the women as an intimate and secret relationship that others can only share vicariously. The relationship is mysterious to all but the dyad; the pregnant women are the only ones that truly know when their *"baby"* is awake and communicating. The women feel this especially through the medium of fetal movements *"I think it's lovely ... it's something that you have and only the two of you know ... the baby moves and it's only you and the baby that have got that, unless you tell someone!"* Fetal movements are perceived as a method of communication, a way the fetus can let their mother know that they are safe and well *"I like the feeling, it's reassuring, amazing"; "As long as I've felt it move ... I'm quite happy ... If it hasn't moved much I'm sort of going "come on move about" and suddenly it'll kick and I'll know it's alright."* This communication was reciprocal with women stating that they always responded to the kicks by either talking to their *"baby"* or by fondling their belly *"... when it moves I have to sort of reassure it and say, yes I know you're there and you're not on your own."* The participants were uniformly elated when their pregnancies were confirmed. Especially for two of the participants who had suffered previous reproductive failure and this pregnancy was deemed precious, describing their feelings as *"really, really pleased"; "...desperately*

wanted" and *"very happy"*. This *"elation"* was not shared by their partners, who appeared concerned that it was too early to ascertain whether the pregnancy was viable. The women were *"disappointed"* with this reaction. Unanimously the women felt that although their partners participated within the pregnancy, it is only they that are truly attached to their developing fetus, *"I think I do see it very much as mine for now"*. The exclusive feelings of possession, closeness and affection for their fetus are so unique that one participant stated that following the birth *"I have thought you know, I'm gonna miss it!"*

This unique relationship resulted in what are described by the participants as an overwhelming and natural sense of *"responsibility"*. The participants identified that paramount within their perceived role as a pregnant mother was the need to provide **protection**. *"I'm here to, sort of, carry it, to make sure that it's alright and to not harm it in any way by what I drink or eat and where we go and different things. You've got like ...a sense of responsibility for it."* The women had actively sought information about pregnancy and as a result altered their diet and life-style to ensure a healthy intra-uterine environment for their developing *"baby"*. The prevailing feelings the women expressed for their fetus was protective. Although one participant stated that fetal movements evoked *"... a sense of love"*, she explained that this emotion was transitory. It was not the deep-rooted love

she would expect to feel when the baby was born, *"I think for me the constant love will come when it's here!"* To her the fleeting feelings of love stimulated her need to protect. For three of the participants being older mothers had raised concerns about the increased risk of congenital malformation. As a result antenatal screening for anomaly with the possibility of termination of pregnancy was of specific concern. The women had given this great thought and demonstrated protective behaviours *"I decided not to have the tests ... I thought if we had the blood tests I would be worried ... I wouldn't have considered a termination!"*. One participant had the blood test but didn't want to have any more invasive tests, although she was concerned that her partner may have insisted *"I didn't really want to get to the point of discussing with my husband whether we would have the amnio test ...I didn't want one!"* She was however adamant that whatever the result she would not consider termination *"... what I sort of believe is however the baby comes out I shall love it anyway and there wasn't any question in my mind of having a termination!"*

Partner support was an essential part of the women's experience of pregnancy. Although the women stated that the pregnancies were essentially their safekeeping, they perceived their pregnancy as shared *"We were pregnant ..."*; *"It's something shared and special."* All the pregnancies were planned and very much wanted. It was stated that as a result of pregnancy

they felt "*closer*" to their partners "*I do feel as if we, I don't know, feel complete.*" The partners were actively involved in all decision making and as the pregnancy became more evident began to be more involved. "*He does stroke my tummy, he talks to the baby and he's very excited.*" For most of the couples the twenty week ultra-sound scan was a watershed. From that point the couples perceive their pregnancies viable and began to appportion human characteristics. "*It put its thumb in its mouth... which was very cute.*" It is as a couple that their fantasy child emerged through privileged conversations "*We've talked about what we'd like the baby to look like ... and obviously whether it will have ginger hair*"; "*Me and my husband both play instruments. We're not particularly gifted at all, we just play. It would be nice to have a prodigy!*" The men were protective and caring towards their pregnant partner. It was suggested that the men could feel at times isolated, not full participants within the pregnancy. They had provided physical support but could only participate within pregnancy vicariously: "*he said he still feel to a degree detached ...I've got nothing to do ... it's got nothing to do with me!*" The men were looking forward to the arrival of their baby when they could actively become involved within childcare.

For the women interviewed, who had suffered miscarriage or infertility, their experience could be described as that of a **tentative pregnancy** - that is a pregnancy which for a variety of reasons is perceived as threatened

resulting in anxiety. Even at the twelve week ultra-sound scan, which for many women is the defining moment that confirmed fetal viability, these women and their partners were still apprehensive *"I was emotional but you're sort of 50% thinking this is wonderful and 50% thinking well you're not out of the woods yet. Anything could happen, so I don't get too attached or too excited because you've got a long way to go and things could happen. I think I've been like that all the way through."* The anxiety felt by one participant was constant and even at thirty four weeks gestation she continued to be anxious about the safe and healthy arrival of her baby *"...the baby's breech at the moment and it's bigger than what it should be. So I'm still worrying about things like that!"* The women agreed that the safe arrival of their babies is more important than a birth experience emphasising their protective role *"As long as it comes out alright and it's healthy that's all that matters!", "they're the experts they know exactly what they're doing so bear with them!"*

One participant has been anxious so long that she had concerns for how she would feel towards the baby *"But even when it's born, even if it's nice, I'll probably look at him and not really recognise him and you think to yourself you've suddenly got to love this baby!"* However she also stated that she's read so much that she felt she should be capable of caring for her baby and worries that she will usurp her partner's involvement! Some of the group considered themselves older mothers. These women were concerned that

they may have difficulty adapting to their new roles following their births *"I feel old at the moment, I'm 34. To start with I think it's going to be a massive, massive change."*

For the interviewees parental involvement was important, but it was their partner who would provide the main support. For the couple who suffered three years of infertility the discovery of pregnancy was particularly poignant. The woman's father was terminally ill and they were able to share with him news of the pregnancy before he died: *"I was able to tell him before he went that we were pregnant. So that was a really special time and we just thought it was fate that it happened then and not afterwards!"*

All the couples involved their parents in the pregnancy at a very early stage. Their mothers were excited about their daughters' pregnancies, with one participant's mother apportioning an affectionate nick-name to the developing fetus *"My mum calls it Humphrey for some unknown reason!"*

Intergenerational influence had a great impact upon the participants, who revisited their childhood experiences of parenting when exploring desired parenting styles *"We're very lucky we come from very similar backgrounds ... he's sort of been brought up in the same atmosphere, surrounded by love, so we really believe the same things."* The women's perceptions of parental qualities were rooted within their past experiences and collectively described

the most important parental quality as *"patience"*, although they recognise that parenting involves many balanced skills. Three women had very special and fond memories of their deceased fathers who they remembered as having endless patience and time for them, with one couple choosing to name their baby after him *"My dad's been dead twenty years, we're actually if it's a boy, we'll call him after my dad Charlie"*.

The women although enjoying their pregnancy appeared to have some issues with their **physical and emotional adaptation to pregnancy**. One participant felt ill and depleted for the first trimester of pregnancy *"I thought this is unbearable ... I just felt really sick and tired."* The women found that after years of maintaining a trim figure watching their burgeoning stomach develop made them incredulous *"I feel huge ... I catch sight of myself in a mirror or shop window and think "Oh my God", I can't believe that is me!"; "I don't think I realised actually how big it was gonna get!"* However the swelling abdomen was also valued as a positive sign of a healthy pregnancy. *"I think it's amazing this big belly, it's proof, it's almost proof that there's a baby in there!"* The women were also aware of the emotional changes that they were experiencing, with their emotions becoming more labile *"I 'm more impatient ... ready to fly off the handle!"; "I get wound up ... I get so frustrated!"; "I get so angry!"* The participants stated that they empathised

with things that often had not affected them prior to pregnancy *"I get more emotional. I can feel myself getting full ... over everyday things."*

Focus Group 2: Multiparous Women

Thirty concepts were identified on initial coding (Table 14). During core analyses two initial concepts were split to more truly reflect the data. There appeared to be two distinct underlying reasons why the women were "Concerned about being older" (G5). Some participants had not planned their pregnancies and were either planning to return or settling back into their career. The consensus of opinion was that they were "Too old to be pregnant" (G5a). This was the wrong time in their lives to be adding to their family, which they felt was already complete. For the other participants their concern was for the patho-physiological consequences of being an older mother. They were anxious about their "Increased chance of conceiving a malformed child and increased risk of pregnancy loss" (G5b). The concept of "Parenting Skills" (G15) was also divided into two separate concepts which identified from where the parenting skills originated. Parenting skills appeared to emanate either from childhood and their "Experiences of being parented" (G15a) or through negotiation following active "Experiences of parenting" (G15b). Twelve primitive categories emerged.

Table 14: Initial Coding: Concepts identified by Multiparous participants
(Focus Group 2).

No	Concept	No	Concept	No	Concept
G1	Pregnancy not planned	G11	<i>"Baby part of me"</i>	G21	Antenatal Screening
G2	Reaction to discovery of pregnancy - positive	G12	Fetal Movements	G22	Termination of pregnancy
G3	Previous experience of pregnancy	G13	Children involved in pregnancy	G23	Life-style change
G4	Reaction to discovery of pregnancy - negative	G14	Parental Involvement	G24	<i>"Doesn't enjoy pregnancy"</i>
G5	Concerned about being "older"	G15	Parenting Skills	G25	Emotional adaptations
G6	Ultra-sound scan	G16	Following the birth	G26	Gender Preferences
G7	Protection	G17	Life-style already healthy - change unnecessary	G27	Searching for information
G8	Hasn't the time to invest in this pregnancy	G18	Partner reaction	G28	Communication
G9	Feels ill during this pregnancy	G19	Concern for potential fetal malformation	G29	Partner Support
G10	Apportioning human characteristics	G20	Fear of miscarriage	G30	Partner participation in pregnancy

As analyses continued the categories were scrutinised, questioned and evaluated. In the course of reviewing the data the initial concept (G3) "Previous experience of pregnancy" was assessed as redundant, the comments were not exclusive and were added to other more significant concepts.

Primitive categories were methodically integrated and merged until they formed seven distinct and autonomous key concepts that closely fitted the data (Table 15). During this phase memos were written to distinguish the justification for revisions and category integration.

Table 15: Key Concepts for multiparous participants (Focus Group 2)

No.	Nascent themes
1	Physical & Emotional Responses Throughout Pregnancy
2	Protection
3	Tentative Pregnancy
4	Effects of Children/Family Life on Pregnancy
5	Partner Support
6	Developing Attachment
7	Parental Support

The Key Concepts form significant themes that were pervasive and enduring throughout the dialogue. Prevalent within these Concepts were the notions of **protection** towards the pregnancy, social support including both **partner** and **parental support**; and underpinning all notions was the **effects of children / family life on pregnancy**. For these multiparous women they no longer have the luxury of being immersed in their pregnancy. They must consider their existing children and the rigors of managing family life. Within this cohort pregnancy was marred, particularly in the early stages, by the fear of fetal malformation and miscarriage; leading to anxiety and as Rothman (1986) described a **tentative pregnancy**.

For these multiparous women the **effects of children / family life on pregnancy** was the greatest influence on their experience. Their children must take priority over the pregnancy. Family life must continue seamlessly *"I wouldn't say it's not as special as the others ... but you've just got to get on with it."* This was corroborated by all the participants: *"I know I can't get ill this time, I can't afford to let myself get ill ... 'cos I've still got to look after my son"*. The women although they no longer had as much time to be absorbed within their pregnancy, still in quiet periods enjoyed the intimacy of pregnancy: *"I get on with things in the day. It's more of an evening or first thing in the morning that it actually registers it's moving"*. The response to fetal malformation and the option to terminate an affected

fetus was for all participants strongly influenced by parental responsibility to the existing children and efficient family functioning. All of the cohort considered the consequences and responsibilities a handicapped child/adult would possibly bring to the family, with the majority deciding that as a couple termination of an affected fetus would be their considered choice. *"I always felt that the first baby you could cope with anything but if you had a handicapped child afterwards it wouldn't be fair on the others"; "Yes we would terminate ... we wouldn't want to leave our son with a disabled and dependent sibling".*

It would also appear that for the multiparous women there was an issue of gender preference. Two of the women expressed a "yearning" for a girl *"I'd like a girl ... I'd be slightly disappointed if it was a boy"; "I'm desperate for a girl"*. All the participants had as pregnancy had advanced involved their children in the pregnancy, teaching their children about pregnancy and encouraging them to touch and caress their pregnant abdomen. *"The children talk to the baby and stroke my tummy"; "... he comes up and gives the Bump a kiss and a hug"*. It appeared that they are helping their children to develop a relationship with a sibling *"Our daughter is really excited, she wants to help look after the baby"*.

The predominant emotion all the participants expressed towards the fetus was **protection**. *"I feel protective more than anything else, I'd be*

devastated if anything happens". The participants stated that love was something that develops when they could physically see and hold their baby for the first time, until then they are its sole protector: *"... you're looking after a third being now!"*. Even though there was a perceived lack of time to invest within the pregnancy, all women stated that this pregnancy was as special as their others. All of the participants agreed that they had been more *"concerned"*, *"careful"*, *"anxious"* and *"protective"* towards this pregnancy. The women felt the fetus was an indivisible *"part of me"*, with the fetus reciprocating and synchronising behaviours to that of the women. Fetal movements were welcomed and enjoyed when the women had peaceful moments alone to appreciate their pregnancy experiences. The movements were welcomed as evidence that the fetus was healthy. *"I welcome them. I like to wake up in the morning, it gives a kick and I think "oh it's OK"*. Although the women had stated that they were more inclined to abort a handicapped fetus, this was only as a last resort to safeguard their family from the perceived traumas of caring for a demanding child / adult. The women had actually chosen to have less invasive tests for Down's Syndrome which would eliminate the need for more invasive tests which carry the risk of aborting a healthy fetus, thus protecting the pregnancy from potential harm.

The need to change life-style to foster a good intra-uterine environment was generally not seen as necessary as most of the participants

believed their diet to be healthy. But they had, as is appropriate to each individual, stopped drinking alcohol, smoking and taking vigorous exercise. Most women had not perceived the need to search for information *"I haven't done any specific reading cos after two children I know what to expect of pregnancy and have no worries about caring for the baby"*. However they had read pertinent literature when they had encountered situations or possible tests that they had not previously experienced: *"...on the twenty week scan they picked up dilated kidneys ... I did go on the internet to find out more about that!"*

All the participants for differing reasons were anxious about their pregnancies, either due to previous poor obstetric history, being an "older" mother, late confirmation of pregnancy or from vicarious experiences. The concept of **tentative pregnancy** was experienced to some degree by the entire group. One participant was unaware of her pregnancy until she was fourteen weeks pregnant and she feared her lack of awareness had exposed her fetus to harm: *"I felt guilty that I hadn't known I was pregnant, I could have lost it! I shouldn't have done all that lifting and rushing around during the house move!"* The biggest concern expressed was that their older age exposed them to a higher risk of fetal malformation and fetal loss: *"... because of my age you can have Down's Syndrome and apparently abort naturally almost till the last minute."* The women had not make their

pregnancies known to anyone but an intimate circle until viability was confirmed and the diagnostic evidence that their fetus was not suffering a major malformation with subsequent need for termination was made. *"I sort of kept the pregnancy under wraps until I got to eighteen weeks ... cos I felt if anything had to be decided it had to be a private decision without everybody knowing".* Miscarriage was identified by all as a real and worrying complication *"I was really wary the first three months cos of miscarriage. My twin sister had one and I've known friends miscarry. Cos it was planned I wanted to do everything possible so I didn't miscarry!"*

Social support appeared essential to a happy pregnancy. The group were all in co-habiting relationships, the women identified their partner as the most important support. **Partner support** was essential for the women. In the two incidences of unplanned pregnancy it was the partner who was instrumental in the women's acceptance of their pregnancy. Both women had made decisions that their family was complete. Pregnancy was unwelcome and was greeted with shock and tears. It was the partner that facilitated acceptance: *"He bought home a bunch of flowers and said "no more crying, let's get on with it".* The partners were participating in antenatal care and actively involved within decision making. The partner of a participant who suffered a miscarriage in her previous pregnancy was concerned and attempted to be more involved with this pregnancy: *"My husband seems to*

enjoy feeling this one more. He wasn't that bothered with my first child". For one participant it was her partner's first child. He was excited and actively participated in the pregnancy. She stated that she felt "*closer*" to her partner. Parenting skills were also negotiated, based on both previous experiences of being parented and as a result of experiences with their other children. **Parental support** was also important with the women describing "*close and supportive*" relationships particularly with their mothers. Some mothers helped with childcare. With all parents offering to provide practical help post-natally and care for the children during the birth allowing the couples an intimate birth experience. "*I want to spend time alone just me, my partner and the baby without the others. I just feel I haven't given this one my time and I want to spend some time just as a family*". Parenting skills appeared to evolve from childhood, with one participant describing in glowing terms her mother's parenting skills "*Mum was always attentive and loving. She had time and patience for each of us. She was always there for us but she also gave us the freedom to become independent.*"

For this cohort **attachment is developmental**. Women fearful of pregnancy loss for the first twelve weeks found the first ultra-sound scan vital in accepting the viability of the pregnancy and beginning the process of attachment. "*I was overwhelmed*"; "*The scan made the pregnancy a reality, I was shocked that the pregnancy could have advanced so far without me*

knowing", *"It's more real ... you can see its arms and legs"*. Fetal movements appeared to enhance attachment, with the participants assigning characteristics based on when and how the fetus moved. *"She moves mainly in the evening - She's a six to ten type person"*; *"the movements are slower and more peaceful, I think this one is like me a little laid back!"* All participants enjoyed fetal movements perceiving them as a form of communication. A way the fetus could tell its mother that it was safe and well. *"I like the baby moving, I sort of think it's telling me it's alright"*. The women responded to the movements either by talking to their *"baby"* or fondling their pregnant abdomen. On confirmation of pregnancy the women were reticent to become attached to a *"baby"* that could either naturally or by necessity be lost. As the fetus was visualised by ultra-sound scan and began to make progressively strong and more definitive movements the women increasingly invested emotionally in their fetus.

Initial **physical and emotional responses to pregnancy** varied amongst the group from *"absolute delight"* to *"shock"*. For two participants the pregnancy was unplanned and initially unwanted *"I was upset, I cried for a bit. It's the first one I've cried over!"*; *"I'm too old to be having another baby ... I wanted my life back!"* Both women, with help from their partners accepted their pregnancy and rapidly become excited and protective. Three out of the four participants felt *"too old for pregnancy"*, blaming their intense

experiences of the minor ailments of pregnancy on their age. All participants felt ill during pregnancy, worse than in their previous pregnancies with the majority stating that they did not enjoy the experience of being pregnant *"I'm constantly sick with headaches ... I just hate the fact that I'm tired and ache and I haven't anything to wear!"* One participant said she felt embarrassed at antenatal clinic saying she *"felt old enough to be the other women's mother!"* Emotionally they felt that their first pregnancy had changed them forever *"I found that once I'd had the first there were loads of things I couldn't watch ... I can't watch any sort of thing that's got cruelty in it!"* However the women agreed that this pregnancy had exacerbated their emotional responses *"I'm much more emotional, I'm crying all the time, get easily upset"* Although not enjoying the physical constraints of the final trimester of pregnancy all the women enjoyed their special *"closeness"* to the fetus, especially the fetal movements *"I'm enjoying the feeling of feeling it move more now than I did the first time and its more important .. It has more significance!"*

Focus Group 3: Teenage Women

On initial coding 39 concepts were identified (Table 16).

Table 16: Initial Coding: Concepts identified by Pregnant Teenagers (Focus Group 3)

No	Concept	No	Concept	No	Concept
T1	Planning for future	T14	Pregnancy unplanned	T27	Fear of unknown, of being abandoned & alone
T2	Friendship	T15	Fear of weight gain	T28	Pregnancy part of them - baby perceived as "mine"
T3	Initial reaction to discovery of pregnancy - scared, shocked, crying	T16	Pregnancy	T29	Views partner in terms of a "provider"
T4	Pregnancy - special & important	T17	Baby shared	T30	Breastfeeding - embarrassing & antisocial
T5	? pregnancy planned, despite protestation	T18	Labour associated predominately with pain	T31	Parental reaction - anger, shock, disbelief. ?unsupportive of pregnancy
T6	Supportive partner	T19	Natural childbirth - but pain may determine choices	T32	Choice of feeding method
T7	Termination of Pregnancy	T20	Fetus referred to as "It"; "the pregnancy" or "baby"	T33	"Close" to mom - needs her approval
T8	Searching for information about pregnancy & fetal development	T21	Social stigma of teenage pregnancy - fear of being judged & labelled	T34	Centrality of Family
T9	Choosing names for baby	T22	History of being bullied	T35	Change in life-style
T10	Parental reaction to pregnancy	T23	Protective feelings & behaviours	T36	TOP underlying reason for pregnancy
T11	Rationale for parental support	T24	Ambivalent partner	T37	Immaturity - adolescence egocentricism
T12	Support from parents	T25	History of heroin abuse	T38	Opinion & commitment to education
T13	Unreality of pregnancy ?immaturity	T26	Changed diet due to pregnancy	T39	Ways of speaking about the fetus

During core analyses certain concepts were identified as flawed, not being causal, challenging nor expanding the emerging themes and were as a result discarded (T17, 19 and 38). T19 and 38 were incorporated into other more dominant and definitive concepts, whilst T17 was abandoned as an isolated statement that was not truly representative of the participants feelings towards the fetus. Fifteen primitive categories were identified (Table 17).

Table 17: Core Analysis: Merged categories. (Focus Group 3)

Discovery of pregnancy distressing	Intergenerational Support	Permanency of pregnancy
Positive perceptions of fetus	Behavioural signs of attachment	Immaturity
Pregnancy planned	Importance of a supportive partner	Friendship
Reactions to physical signs of pregnancy	History of drug abuse and bullying	Social stigma of teenage pregnancy
Pervasive effects of Termination of Pregnancy	Protection of the pregnancy / fetus	Perceptions of breastfeeding

Eight Key Concepts were identified (Table 18) which reflected the teenagers' emotional and resulting behavioural responses to pregnancy. There were three powerful, dominant and interlinking concepts to emerge. The teenagers perceived **pregnancy as special** eliciting actions and behaviours that resulted in **protection for the pregnancy**. For all participants **support** was crucial. The eight Key Concepts are discussed within the chronological framework they occurred from the shocking discovery of the pregnancy to the elements of emotional reaction that appeared to be unique to adolescence.

Table 18: Key concepts: Pregnant teenagers (Focus Group 3)

No.	Nascent themes
1	Teenage reaction to the discovery of pregnancy
2	Parental reactions to the news of pregnancy
3	¿Pregnancy planned
4	Pregnancy Special
5	Permanence / stability of pregnancy
6	Protection of the pregnancy / fetus
7	Importance of social support
8	Adolescence and pregnancy

The initial reaction was **distress**. The overwhelming emotions described were shock, fear and incredulity. *"I was really scared I didn't know what! My head was all messed up. I couldn't stop crying!"*; *"I was scared, I thought this can't be happening to me!"* It was commonly held that pregnancy

was impossible, with participants claiming that the pregnancy was unplanned and unexpected.

Certainly for one participant it was totally unplanned as she had used contraception. *"I was a week late and I thought I can't be pregnant! I used protection both times"*. In fact she performed two pregnancy tests before she was convinced that the pregnancy was a reality. The emotion generally described was utter despair as they struggled with the very real possibility of angry parental reactions and the ultimate anxiety of their ability to cope alone as teenage mothers. *"Oh God, I was like I'm not gonna have no-one. I'm gonna have no money, I can't get a flat and I'm gonna be homeless"*. There was also concern expressed about the stigma and stereotyping of teenage mothers; this was compounded by the feeling that they had failed their parents and would bring social criticism on their families. One participant feared stigmatisation and people judging her pregnancy as a self-fulfilling prophecy. *"I'm scared like people where I've actually grown up 'cos I know the first thing they're gonna say is 'she's been on heroin and now she's pregnant!'"*. This participant believed that she came from a neighbourhood where teenage pregnancy was unusual and their family would be singled out for criticism and ridicule *"... it's just that, like my brother 'cos he was like 'Oh my God what are people going to think of this family'"*. Although fear of telling parents was a key issue, most participants told their parents early in pregnancy.

Parental reactions to the news of pregnancy were as the teenagers had envisaged negative. Two of the participants' parents were separated and in subsequent co-habiting relationships. The teenagers although living with one of their parents chose to inform both of their birth parents. Reactions included shock, disappointment, anger and disbelief. The adolescents' birth fathers would not initially talk about the pregnancy and future. In fact the fathers chose to totally ignore their daughters for a period of time: *"My dad ... wouldn't talk to me at first, he was like NO!"; "My dad wouldn't talk to me for about a week"*. One participant's mother was fearful for her daughter's future and encouraged her daughter to consider termination of pregnancy: *"My mum was like "you'll wreck your life" and that"*. The disclosure of teenage pregnancy caused arguments and distress: *"I used to shout at my mum 'cos we used to have terrible arguments. Her and my Nan used to double deal me and start having a go"*.

These arguments and discussions appeared necessary to vent anger, face the reality of unplanned pregnancy and to explore plans and coping mechanisms for the future. The participants made it clear that termination of pregnancy was not an acceptable option. With the need to ensure a healthy pregnancy the parents with whom the teenagers lived grudgingly accepted the inevitable and began to offer support. *"When your step-mum gets up with your dad and says "look you've got to support her""* the result is *"...they are*

both fine with it, they both came around". One parent continued to be unable to either accept her daughter's pregnancy or offer her support *"... but my mom, she hasn't really come round yet, so I doubt she ever will".* For the participant without a boyfriend telling her parents had been particularly difficult, she chose to conceal her pregnancy for 20 weeks before telling: *"I think I just hoped it wasn't true, I've only ever had it once, it's so unfair".* Yet after a short period of distress and anger both parents offered full support, arranged antenatal care, attended with her and even attended the support group with her to encourage her to meet other pregnant teenagers.

The teenagers did not appear to have considered the fragility of pregnancy and the possibilities of miscarriage or congenital malformation. They appeared to have an unshaken belief in the **permanence and stability of pregnancy**. They had already chosen their baby's names. They were also exploring and making decisions for the birth and childcare. *"I want to go through it (labour) as naturally as I can"; "There are hand-ones (breast pumps) which I'm gonna get so my boyfriend can feed as well".* Although there were many months of pregnancy to traverse the teenagers were confidently planning for the birth of their *"baby"*. This could be a counter reaction to the real threat of social termination that was the preferred option for their parents.

The majority of the participants stated that their pregnancies were unplanned and a distressing discovery. However one participant as the discussion unfolded appeared to have been distressed only in the very short-term and may have planned her pregnancy: *"I was really scared ... I couldn't stop crying, but then a couple of days after, it sort of sank in and I was really excited".* This participant had the year before at the age of fourteen undergone a social termination of pregnancy. She had ultimately found this experience physically and psychologically devastating; during the group discussion she repeated and emphasized her distress: *"Both physically and emotionally it's horrible, so I couldn't do it again".* She clearly stated that this pregnancy was now beyond the nine week stage that marked the gestation when her previous pregnancy had been aborted and she appeared very happy with this: *"So I've never been this pregnant before!".* Her boyfriend had supported her decision to continue with the pregnancy. It would appear that she has chosen her boyfriend with prudence, an adult who could both provide for a family and fulfil her romantic view of family life: *"He's really supportive; he's got a job and everything. He's 22, which is a bit old! ... I love him ... he's got a flat and he's well paid".* She appeared to have considered the future. She had carefully chosen a partner who she considered reliable and financially stable, able to provide a home for their baby and herself. She also planned to continue her education, she had found and secured a place at a college

relatively early in pregnancy that had crèche facilities: *"I'm going to College for my last year at school, they already know. There's a crèche there!"*. Her support mechanisms were being put into place, with her boyfriend moving nearer to her parental home. Her father and step-mother had decided to provide all the practical support they could: *"My dad and step-mum are definitely going to support me the best they can and help me money wise and everything"*.

The participants, once the initial shock reaction had been addressed, commonly viewed the **pregnancy as special**. The fetus was perceived as solely belonging to the expectant mother: *I was really excited like, thinking I had a baby inside me"*; *"I can't wait to actually see my baby ... it's got a piece of me in it."* The teenagers actively and eagerly searched for information about their developing pregnancy and were absorbed by the wonder of childbearing: *"I sit there and think ... how big is it, what organs are developing, what it is doing and everything?"* The signs of pregnancy were welcomed as positive signs that the pregnancy was progressing. *"It didn't sink in until I started to get morning sickness and then I thought yeah! I'm really pregnant!"* Information was eagerly sought from books and parents, with resulting changes to diet and life-style to obtain and maintain a favourable intra-uterine environment for their *"baby"*.

A significant and enduring concept throughout the interview was the **protection** afforded to the pregnancy through the teenager's decisions, actions and behaviour. From the initial confirmation of pregnancy the participants were determined to protect their pregnancy and actively resist any parental pressure to terminate their pregnancies. One participant counteracted her mother's argument that teenage motherhood would *"wreck her life"* with personifying the fetus arguing *"... for God's sake this is your grandchild!"* The same bargaining tool was used to encourage and rationalise active support from parents. The participants have actively sought information about pregnancy, in particular the facts regarding a safe and healthy intra-uterine environment to ensure optimum progress for their fetus. Smoking had been considerably reduced, alcohol consumption stopped and the participant that had been a drug abuser had remained off drugs for nearly four months. Diet appeared particularly important. Foods with potential to harm either the pregnancy or fetus had been rigorously eliminated from their diets. This extended to ensuring that infection was not ingested through inadequately cooked meat with one teenager having refused to eat meat at a family barbeque for fear of catching toxoplasmosis.

To the participants the **importance of social support** was paramount. Their obvious lack as young teenagers of financial independence to provide the means to adequately care for a baby was of immense concern

to them. The teenagers appeared to need both the approval and support of their parents in order to realistically believe that their childbearing experience would be successful. However for one participant, she had initially more support from her boyfriend and his mother. She had found it very difficult to tell her mother. Following the initial period of shock, disappointment and anger the parents did offer the desired support. For one teenager her mother's acceptance of the pregnancy and unconditional support was essential. Her mother had helped her overcome her heroin habit. During this time they became very "*close*", developing and building a "*great trust*". Pregnancy had initially affected this relationship and the participant felt she had "*let her family down*". In support of the centrality of the teenagers' mother to the continuity of the pregnancy, is that the mother became a valued source of information and advice: "*I don't want to breast feed ... my mum never at all*". To this participant her family were important; she also discussed the influence of her father, brother and grandmother. For the participant that may have planned her pregnancy her support was to be both from family and her boyfriend. The boyfriend was to be the main support. His continuing support was crucial to the decision not to terminate this pregnancy. For the teenagers support needed was more than social; due to their dependent status their needs were more extensive embracing social, psychological, physical and financial requirements. For the adolescent without

a boyfriend, her family were providing all the encouragement and assistance. They had never encouraged her to abort the fetus and were pro-active in ensuring she accessed adequate antenatal care. It was only when the support was forthcoming that the teenagers felt they could look forward to with any confidence becoming parents *"Now they've come round and are quite excited about it I can't wait to be pushing the pram and actually seeing my baby ... I can't wait."*

There were elements within the focus group discussion that appear specific to **adolescents and pregnancy**. Support appears to encompass not only partner and parent, but also peers. For two of the participants their friendship and continuing collaboration was an essential part of their acceptance of their pregnancies. The participants revealed their condition to each other before they told their parents. They provided the necessary encouragement and sympathetic understanding during the frightening process of "telling" their parents about their pregnancy. *"I used to ring you up crying"*. They acted as confidants, discussing and providing rationales for not aborting their pregnancy. Immaturity is evident in both of their initial reaction to pregnancy. One participant stated that when pregnancy tests proved positive she found it *"funny"*. It wasn't until she later told her mother that the full complexity and gravity of her situation became apparent, with the real possibility of the threat of termination clear. The teenagers

appeared egocentric within their debates on pregnancy - although fearful of parental responses it was their needs that were paramount; albeit that they acknowledged parental disappointment it was their aspirations and desires that were supreme.

Although three out of the four teenagers had been sexually active for some time, they exhibited an immature sexuality and need for peer group acceptance. This became particularly evident during their discussion on breast feeding, which they viewed as inappropriate in company. The thought breast feeding whilst in company was embarrassing and distasteful. *"Yeah but like you could be in a café like, and if it wants feeding where do you go? What if some lad walks up and says "oh look!"* It remained important to conform to their peer group and remain within their peer groups narrowly defined criteria for acceptable standards of behaviour. This was particularly important for those participants with a history of being the victim of bullying. Weight gain during pregnancy was also an issue for these adolescents. One participant blamed the bullying on being over-weight and prior to becoming pregnant was enjoying *"... the lads taking notice of me"*. She had valued her slimmer, more attractive figure and the ability to wear more fashionable clothes.

7.3: Integration and exploration of the themes from all groups to produce Key concepts

Following data collection and analyses of the findings from both the ten one to one interviews and the three focus groups, the nascent themes were pooled providing a rich triangulated data source to be analysed for commonality in order to produce a definition and structure for the psychometric tool to measure maternal-fetal attachment. The nascent themes from all five analyses were explored and assimilated until the themes became saturated and the key concepts emerged (Stage 8, Data Analyses). During this process it was necessary to re-examine all nascent themes, to look again at the concepts within each set to identify whether similarly titled themes contained interrelated or incongruent data on attachment. As a result themes were refined, sub-divided and incorporated to produce key concepts e.g. all women desired support from those closest to them including partners, parents and friends. This was labelled as social support, as it appeared to be the provision of caring, effective support that facilitates attachment. Following analyses six themes were prevalent within all groups, with four themes although not pervasive, appeared very important to more than one group (Table 19). It was felt therefore that these should be included within the initial questionnaire for testing.

The three dominant themes that prevailed throughout all discussions were the **intimacy** and exclusivity **of pregnancy**; the emotional and behavioural **protection** that this provokes and the **social support** essential to allow the women the emotional and physical resources which were necessary for developing attachment. Three further themes were common and pervasive. All women described how their bodies had made both **physical and emotional adaptations** to accommodate their pregnancy. These were either welcomed or tolerated. Women stated that **attachment developed** as their pregnancy became apparent and viable. With fetal movement stimulating what the women considered were reciprocal communications. Fetal movements were also fundamental in the women apportioning an independent personality to the developing fetus. The final common theme **tentative pregnancy** (a pregnancy marred by fears of pregnancy loss) was common to all the primigravid and multiparous women interviewed; however the pregnant adolescents were unwavering in their belief in the certainty of their pregnancies.

Some themes appeared to be important to one or more of the groups and are therefore essential to consider. For the pregnant adolescents and for those women and partners who did not actively plan the pregnancy, the **unwanted pregnancy** often caused severe distress. Pregnancy was a shock, an event that would necessitate major life changes. For the teenagers there was

the awesome task of placating outraged parents, who they must calm and convince that parenting as a teenager was feasible. For the women who believed their family was complete and they were now able to concentrate on fulfilling their careers, there was a belief that just when they "*could get their life back*" the pregnancy had thwarted their ambitions.

Specific to the multiparous cohorts was the **effects of children / family life on pregnancy**. No longer could they luxuriate in the experiences of pregnancy as the demands of family life and the needs of the children must take priority. Decisions regarding the pregnancy were taken within the context of the potential effects on existing children and the family. A further concern voiced by some primigravid women but more often by the multiparous participants was that they had a preference for the **gender of the fetus**. Whilst this theme is comparatively small it appeared important to the women and to their perceptions of how they would feel at the birth. Of interest is that both women whose partners had rejected the pregnancy believed that the babies' gender had a great impact and influenced ultimate acceptance. A linked theme following birth was the worry expressed predominately by the primigravid groups as to their **ability to mother** the baby efficiently.

Table 19: Integrated Key Concepts and Important Themes

Key Concepts	Important themes
<ul style="list-style-type: none"> INTIMACY OF PREGNANCY Behavioural signs of attachment (Interview Group) 	<ul style="list-style-type: none"> Effects of unwanted / unplanned pregnancy Effects of children / family life on childbearing experience Effect of baby's gender Ability to provide good parenting
<ul style="list-style-type: none"> PROTECTION 	
<ul style="list-style-type: none"> SOCIAL SUPPORT Partner Parent Peer 	
<ul style="list-style-type: none"> PHYSICAL & EMOTIONAL ADAPTATIONS TO PREGNANCY 	
<ul style="list-style-type: none"> DEVELOPMENTAL NATURE OF ATTACHMENT 	
<p>TENTATIVE PREGNANCY Early pregnancy fears Fragile pregnancy</p> <ul style="list-style-type: none"> Ambivalence of early pregnancy Experiences of poor pregnancy outcome 	

The overwhelming emotion shared by all women within the study was **protection**. Every participant had clearly stated that they felt tremendously protective towards their fetus. Even though the multiparous women agreed

that they could not be as self-absorbed as they had been in previous pregnancies, with care of their families taking priority, they all agreed they had been more "*concerned*", "*careful*" and "*protective*" towards their pregnancy. This sense of protection encouraged the women to alter behaviours that may potentially harm their fetus. All women reviewed their life-styles, sought current information and actively eliminated or avoided any behaviours or substances that could potentially harm their fetus. It appeared appropriate to integrate into the theme of protection the nascent themes from the interviews "Behavioural signs of attachment", as these emanated from the desire to provide the most suitable environment to stimulate healthy fetal development. The need to protect extended to the refusal of invasive screening tests that carried the risk of fetal loss. "*I didn't really want to have the amnio' ... because that can cause miscarriage*" (multiparous participant). It also encompassed the refusal of termination of pregnancy (TOP) in any circumstance. For all participants within the study for whom termination of pregnancy had become a real issue, regardless of age and parity, their determination to protect their fetus and continue their pregnancy was paramount. "*I wouldn't have considered termination of pregnancy*" (primigravid participant), "*I couldn't go through it (TOP) again*" (adolescent participant).

Both the interview and focus group participants agreed that although they considered their fetus very precious, the emotion they were experiencing could not describe as love. One primigravid participant did say that fetal movements evoked "*a sense of love*" but she qualified this by saying that the emotion was transitory and did not persist. She believed that this was not like "*the constant love*" that she expected to experience when the baby was born and in her arms. The consensus of feeling amongst the cohorts was that love would come with their baby, when they could see and hold it.

For all participants their pregnancy, whether planned or not, was now described as "*special*". They all agreed that they had an exclusive and extraordinary relationship with their "*baby*". Participants in all groups stated that their fetus was "*part of me*", one primigravid participant described the relationship as "*almost sensual*". Within the groups there was a belief in the **intimacy of pregnancy**, their relationship with the fetus was private and privileged. Only the woman knew when the fetus moved and she could choose with whom she shared this secret. For the participants, fetal movements were a form of communication - the "*baby*" moved to let their mother know that they were healthy. The women responded by fondling their pregnant abdomen or talking to the fetus. "*You talk to it and rub it and ... if it gets agitated you can, sort of, calm it down*" (Interviewee 8. multipara). Elements from the theme of "behavioural attachment" that demonstrate the intimate

verbal and tactile communication with their baby have been included within this theme. Although many of participants felt the pregnancy was shared, their ultimate belief was that the fetus was an indivisible part of them, for whom the women had absolute responsibility *"... you're looking after a third being now"* (multiparous participant).

Social support was crucial to the women's emotional and physical well-being and developing attachment. For the groups interviewed social support came predominantly from partners and parents. For the pregnant adolescents the support of a close friend was also important especially during the harrowing period when pregnancy was first discovered and the fear of telling angry parents awesome. These nascent themes were combined into a larger theme encompassing all aspects of **social support**. For those women whose partners were supportive, it was the partners that were perceived as the most important and constant source of support. Pregnancy was often perceived as being shared with their partners. The primigravid participants revealed that pregnancy had brought them *"closer"*. *"I feel the pregnancy has brought us together. It's something shared and special"*. For the multiparous women who did not plan their pregnancies and were initially distressed it was their partners that facilitated acceptance. Partner support was essential for the adolescent, who had a year previously had a social termination of pregnancy. Her partner's pledge of support was crucial, allowing her to tell

her parents in the knowledge that she would be supported to continue her pregnancy.

With all participants decisions regarding the pregnancy were discussed and negotiated with their partners. The majority of the partners had attended antenatal clinic visits as far as practicable. Women encouraged their partners to vicariously become involved with the pregnancy. *"He does stroke my tummy and he does talk to the baby"* (primigravid participant); *"He touches it more and watches it move, he even asks if I'm taking it easy"* (multiparous participant). The couples had discussed parenting. Partners were being encouraged to actively take part in baby-care following the birth. The pregnant adolescent had even thought about expressing breast milk so that her partner was able to occasionally feed their baby.

Parental support was also important to all participants. The support offered and expected varied according to perceived need. For the pregnant adolescents (who were under sixteen years of age) parental support was essential to provide their necessary physical, social, psychological and financial needs. For one of the adolescents whose mother had helped her break her heroin habit, it was imperative that her mother accepted her pregnancy. Initially shocked, angry and disappointed the parents following a traumatic period of adjustment accepted that their daughters would not terminate their pregnancies and began to offer appropriate provisions to

ensure the pregnancies were healthy. Parents were important to all women. To one primigravid woman the discovery of her pregnancy was particularly poignant, as after three years of infertility she was able to tell her much loved terminally ill father two weeks before he died that she was at last pregnant. All couples involved their parents at a very early stage of pregnancy. Parents were the first outside the couple to be informed about the pregnancy. Multiparous women described *"close and supportive"* relationships with their mothers. Many of whom would be providing practical help caring for the children at some time during this childbearing experience. The intergenerational influence of parents on attachment behaviours and parenting styles was evident for all participants.

The participant's **physical and emotional adaptation to pregnancy** varied from happy acceptance to feeling *"clumsy and uncomfortable"* (multiparous participant). Early pregnancy symptoms were generally disliked by the majority of participants *"...how on earth do people do this, just have baby after baby. I thought it was unbearable ... I just felt sick and really tired"* (primigravid participant). However one of the pregnant adolescent welcomed her symptoms as evidence of her pregnancy. Most women were shocked at the size of their burgeoning abdomens, that they could ever get so large! However this was generally appreciated as a sign of a healthy pregnancy. The two multiparous participants with unplanned pregnancies felt

too old to be pregnant and as a consequence did not enjoy the changes to their body. *"I just feel so tired this time and I seem to ache all over - I'm sure it's my age"; "I just don't think my body is as capable this time".* All participants within the differing groups were united in their opinion that they had become more emotionally labile, getting upset and being moved to anger and tears easily. *"I get more emotional. I can feel myself getting full ... everyday things ... I'll be more impatient ... ready to fly off the handle!"* (primigravid participant).

Within all groups interviewed attachment appeared to be **developmental** in nature. For the pregnant adolescents there were never any considerations that the pregnancy may end in miscarriage or that the fetus could have a congenital malformation. Their pregnancies were established and safe. The technical visualisation of the fetus, the growing pregnant belly and progressively more potent fetal movements all caused the women to increasingly see the fetus as a real "little person" with their own unique personality. Fetal movements and the resulting covert communication between mother and fetus appeared to be instrumental to the developing attachment relationship. The movements were universally welcomed and enjoyed by the participants. *"I love it moving ...I just love it, it's strange but it's almost a sensual feeling. Then I get emotional and feel a real sense of love"*(primigravid participant). The movements stimulated the development of

this intimate relationship *"The movements are slower and more comfortable, like stretching and turning. She seems calm and peaceful, happy to be in my tummy"* (multiparous participant). Fetal movements were interpreted as the fetus communicating its well-being. *"As long as it, I've felt it move in the day ... I'm quite happy ... If it hasn't moved much I'm sort of concerned going "Come on move about" and suddenly it'll kick and I'll know it's alright"* (multiparous participant). Characteristics were apportioned to the fetus according to when, where, how and in response to what stimuli it moved. Partners and children were encouraged by the women to become vicariously involved when the fetus moved by fondling and talking to the maternal abdomen. This could be an attempt by the women to stimulate the development of attachment in other family members.

For all participants there were differing concerns that led to anxiety and to differing degrees a **tentative pregnancy** - one where there are concerns that the pregnancy may for a variety of reasons not result in a healthy baby. The nascent themes "early pregnancy fears"; "ambivalence of early pregnancy" and "experiences of poor pregnancy outcomes" have been incorporated within this over-arching theme as all nascent themes caused the participant anxieties for the viability of the fetus. All participants stated that they were anxious until the twelve week ultra-sound scan confirmed the pregnancy was viable and the couples visualised their *"baby"*. This was

particularly important for those women who had experienced miscarriage in a previous pregnancy. For some multiparous participants the fear of fetal malformation caused great concern, as due to their age, they had an increased risk of chromosomal abnormality. These women and their partners had decided to abort an affected fetus to protect their family. Pregnancy was tentative until screening results were received: *"We only told a few, very close friends and family ...if anything had to be decided it had to be a private decision without everybody knowing"*. It appeared for the majority that the twenty week ultra-sound scan heralded the transition from belief in the pregnancy to belief in the fetus. *"At the twenty week scan we saw it on the screen, it was bigger and they said it was alright ... we hadn't bought anything up until that point and after that I went out and bought a cuddly toy"; "... it put its thumb in its mouth as well which was very cute!"* (primigravid participants).

The findings of this qualitative study into the emotional responses of pregnant women to their developing fetus were that the primary emotion and overwhelming maternal emotion is protection. This together with their secret and intimate fascination with their fetus caused the women to adapt behaviour to ensure a safe and healthy intra-uterine environment. Social support was necessary to ensure the women had the appropriate psychological and physical means to nurture their pregnancy and developing attachment.

Attachment developed throughout pregnancy. Although for some, particularly the pregnant adolescents, attachment was apparent from confirmation of pregnancy. This could be due to early threats of social termination which appear to hasten the desire to protect the pregnancy. For the majority of the groups the first twelve weeks of pregnancy was tainted by the fear of miscarriage. The twelve week ultra-sound scan confirmed fetal viability and appeared to stimulate the process of attachment. This was reinforced by the twenty week anomaly ultra-sound scan that by identifying major fetal abnormality allowed the women to accept their fetus's normality and reinforced viability. Attachment developed with proof of fetal tangibility, particularly encouraged by the progressively stronger and recognisable fetal movements. Fetal movements were welcomed as signs of well-being and covert, intimate communications that enhanced the attachment relationship.

Additional themes appeared important to some of the participants and will be included within pilot testing and initial testing of the psychometric tool. The additional areas to include are - whether pregnancy is planned, whether the participant has a preference for the baby's gender, whether already having children affects subsequent childbearing experience and whether primigravid women feel ready to parent. Should statistical analyses confirm that these questions were not generic they will be deleted.

7.4: Model and definition of maternal fetal attachment

Maternal-fetal attachment is a complex relationship that is affected by many factors (Figure 4). It is an innate emotion which overwhelmingly stimulates the need to protect the fetus. This need to protect the developing fetus promotes behavioural changes to ensure a favourable intra-uterine environment and eliminate threats to fetal well-being. It is a progressive and to some extent exclusive relationship inspired by tangible signs of viability, as the fetus grows and becomes stronger. The relationship is during early pregnancy ambivalent as the woman attempts to have faith in the reality of her pregnancy, balancing fears of possible loss with the debilitating early pregnancy symptoms. Essential to the development of maternal-fetal attachment is consistent social support. The woman psychologically and physically benefits from the loving support of a partner, parent or close friend. The optimum desired support is that of a partner. Women actively seek sustained and positive partner support. The women encourage their partners to vicariously participate and share in pregnancy, thus facilitating their partner's attachment and protective behaviours.

From this model of maternal-fetal attachment a definition to summarise the main points and provide a theoretical framework to underpin and facilitate interpretation of the questionnaire was produced:

Maternal-fetal attachment describes the intimate and developing affectionate relationship between the pregnant woman and her fetus. It is a natural and protective response that results in behavioural change to ensure fetal survival. This complex, multi-dimensional relationship is fundamentally affected by biological, social and psychological factors.

Figure 4 (below) provides a diagrammatic model of the definition of maternal-fetal attachment, demonstrating the multi-dimensional and inter-dependent nature of the concept.

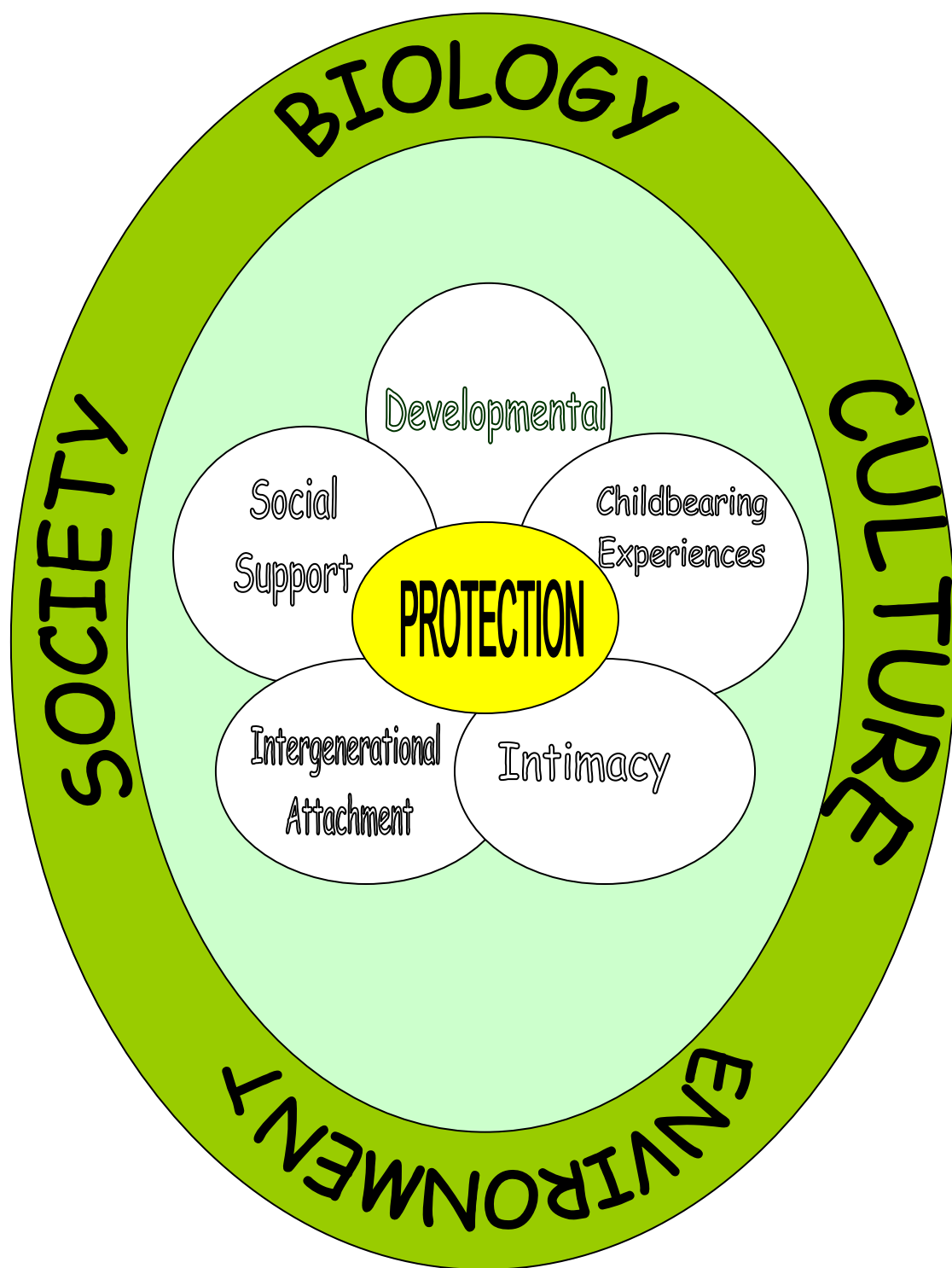


Figure 4: Model of Maternal Fetal Attachment

Chapter Eight

Part III: Developing the psychometric tool

The motivation for developing a psychometric tool is to utilise the definition of maternal-fetal attachment that has been generated from qualitative data collected from pregnant women to underpin and provide a framework (Figure 4) for an assessment of pre-natal attachment. The psychometric tool can also further test the definition on a much larger sample and endorse the emergent theory. A psychometric tool is a carefully constructed questionnaire-type measuring instrument designed to measure psychological factors. It is generally developed to gain insight into aspects of human psychology which are not usually evident (Hayes, 2000). A normothetic framework was used to construct the test; within this model the behaviour to be measured is clearly defined. A normothetic test is norm referenced and person-based, allowing maximum discrimination between individuals (Rust & Golombok, 2000). It involves measuring each person on a common scale and is used to compare one person to another. For this person-based test the score is allocated on a continuous scale, the higher the score the greater the presence of the characteristic being measured.

When constructing a psychometric questionnaire there are many points to consider, to ensure the tool is user-friendly, reliable and valid.

The participant's initial impression of the questionnaire is crucial; therefore a professional layout is important. Instructions should be lucid, easily understood with clear explanations on how to successfully complete the questionnaire. Each item should be clearly numbered, the items should be plainly separated and the font size should be large enough to facilitate easy reading (Rust & Golombok, 2000). It is further suggested that it is useful to experiment with differing fonts, colours, spacings and layouts to achieve the most favourable finish. Important points to decide are the rating scale and the scoring system most appropriate to the tool under construction. The rating scale must suit the data and provide a sufficient range of options to allow the participant to truthfully express their opinion. Rust & Golombok (2000) suggest that the optimal number of options is four. For the maternal-fetal attachment questionnaire an options-ranked rating scale was used. This provides the participant with definitive choices rather than the likert scale (always to never; 1 -4), which is sometimes difficult for the participant to accurately quantify (Hayes, 2000). It was decided to use four options, sufficient to allow adequate expression but not too many to cause confusion. An even number of options was chosen as with uneven numbers the participants often go for the middle-ranking safe option (Streiner & Norman, 1995). As suggested by Rust & Golombok (2000) the options did not appear in the same order for each item, this layout will prevent user bias, assuming that

the optimal answer is always at the same point. In a person-based format the score is allocated according to a continuous scale. Each option within an item is given a score and these are added up to give the participant a total score. This method is simple to score and evaluate, and makes the assumption that each item is equally as important. For the maternal-fetal attachment questionnaire a score of 0 to 3 was awarded to each option within an item according to how it equated to attachment - 0 for those not appearing to demonstrate attachment to 3 for those that appeared to be expressing significant attachment.

The most fundamental consideration was the writing of the items. These according to Streiner & Norman (2000) should be comprehensible and unambiguous to the target population. It is suggested that they are written for a target audience with the reading age of no older than twelve. Questions should not be open to participant interpretation. The questions should be purposeful and options explicit. It may be necessary for some questions to pose a time-scale to focus the participant's mind on the most appropriate answer. It is important that "double-barrelled" questions are not used; that is mistakenly asking two questions within one that could potentially have very different answers, leading to confusion and apathy. It is essential that questions are not leading, written in a prejudicial way that is value-laden and encourages the participant to respond with the socially acceptable answer

rather than their truthful opinion. Jargon should also be eradicated. All these points appear to be common sense, yet writing appropriate unambiguous items is very difficult.

The six key concepts and the four important themes that emerged from qualitative data collection and formed the definition of maternal-fetal attachment were used as a basis to formulate eighteen generic items for all participants, three items specifically for nulliparous women and three items exclusively for multiparous women. The tool was therefore multi-factorial. All questions were equally weighted and each item was directly borne from the emergent themes. In order to assess whether the proposed questionnaire was user-friendly and valid prior to being used in the major study it was piloted on a representative sample of the target population for face-validity and on experts within the field for content validity.

Pilot studies:

A pilot study is essential; it is a "trial run" or a pre-test and should be conducted on a small group of people typical of the target population. The pilot study must be conducted with the same rigour as the main study so that any weaknesses identified are truly representative and through rectification the main study will benefit (Polit & Hungler, 1995). The purpose of the pilot study is to check the design, validity and usefulness of the proposed questionnaire. The pilot study will help refine the items in two ways - firstly it

will identify those questions or options that may be ambiguous, vague, leading or incomprehensible. Secondly it will identify the efficacy of the item, if everyone gives the same answer it can be dropped as being non-discriminatory (Clarke-Carter, 2001). Additional practical and useful details will be gained at the pilot stage that will inform the study; this will include assessment of the clarity of instructions, the authenticity of the tool to the population it is targeted at, and the time taken in real-time for each participant to complete the questionnaire. It will allow the researcher to become acquainted with the setting in which the research occurs identify any potential problems and facilitate the production of contingency plans (Connors & Glenn, 1996).

Initially content validity was evaluated by experts to clarify that all items within the questionnaire were focused on maternal-fetal attachment. This was followed by ten double interviews with pregnant women representing the target population to assess face validity.

Content Validity

Content validity refers to the degree to which a tool covers the range of behaviours within the construct being measured. How representative are the questions asked, of the universe of questions that could be included within the construct (Cohen, Swerdlik & Philips, 1996)? This is achieved by asking experts to analyse the items to assess whether they are typical of the

range of behaviours to be expected within that construct (Clarke-Carter, 2001).

Initially the questionnaire was reviewed by an expert in Family Centred Care and attachment, the expert made many valuable comments:

- The initial questionnaire was in colour which it was felt detracted from its credibility as a measuring tool; further questionnaires were printed in black and white.
- The instructions needed to more explicit and easy to read - a bullet pointed format and spacing was utilised to facilitate reading.
- Question 2 was deleted as not being focused on attachment.
- Question 6, option 2 changed to be consistent with the time scale measure of the other options, to prevent confusion.
- Question 18 /22 were "double-barrelled", asking 2 questions in one with potentially 2 different answers - this was developed into 2 separate questions, one focusing on diet and one on life-style.

Appropriate revisions were made. A section was added on biographical details which would be beneficial for analyses. Three questions were added specifically on inter-generational attachment which it was believed would generate knowledge on this concept from the women's perspective and provide data to test the definition.

Following revision, Draft 2 (Appendix Four) of the questionnaire was piloted for content validity. Draft 2 consisted of 15 generic items, with 4 items for nulliparous women and 4 items for multiparous women. Three expert opinions were sought; an expert on attachment, a developmental psychologist and an expert on psychometric tools. The response from the experts was very positive; comments were made and following consideration some changes were effected:

- Question 4, the options were all within pregnancy therefore not giving a full range of possible experiences, the 4th option was deleted and replaced with an option for following birth.
- Question 13 was reviewed and an option altered to demonstrate the woman's covert relationship with the fetus and the point that many women had made that they often responded to the fetus's movements by fondling their abdomen over the site of the "kick".
- Questions 17 and 21 and questions 19 and 22 were replicated in the specific sections for nulliparous and multiparous women. This was rationalised to become two generic questions, shortening the questionnaire.

These revisions were made and the instructions altered accordingly. On review it was decided that there were no specific items relating to the effects of existing children / family, an important theme raised by the

multiparous women, question 22 was added. A further point of interest that would support the theme of tentative pregnancy was an item on when the women consider their pregnancy's safe. An item to reflect this was developed and included as generic question 18. Draft 3 (Appendix Five) consisted of 18 generic questions, with 2 specific questions for primigravid women and 2 special questions for multiparous women. The questionnaire was now ready to pilot on pregnant women for face validity.

Face Validity

This is a subjective measure to judge whether the tool appears to be measuring what it claims, sometimes known as surface validity. Essentially it judges whether the test is valid simply on appearance (Hayes, 2000). Face validity should be assessed by a similar sample to the target group. These participants however cannot be used within the main study. It is an important part of validation as it reviews the questionnaire from the participant's perspective; reviewing whether the items are acceptable, appropriate and fit for purpose (Rust & Golombok, 2000). Face validity is a crucial stage in the development of a psychometric tool. If the participants do not think the measure is valid they will not take the questionnaire seriously. The method chosen for this pilot study is described by Streiner & Norman (1995) as the "double interview", this involves the participants being told they are participating in an evaluation of a novel test. The participant fully completes

the questionnaire and then discusses any ambiguities or omissions within the tool. This is time-consuming but provides valuable and discerning data and also permits a smaller sample (Foddy, 1993).

This pilot study was conducted in 2 stages, Draft 3 of the questionnaire was assessed by 5 participants and following revisions, Draft 4 was assessed by a further 5 participants.

Stage 1.

Materials:

Draft 3 of the psychometric questionnaire to test maternal-fetal attachment.

Participants:

The participants were an opportunity sample of 5 women, who were attending antenatal clinic at the Midwife-Led Unit (Table 20). The women were all within the second or third trimester of pregnancy, gestation ranging from 23 - 39 weeks pregnant. Ages ranged from 16 - 37 years old. Three women were married, one living with her partner and one single teenage girl living with her parents. Three women classified themselves as White/British and two as Mixed Race.

Table 20: Biographical details of participants in Stage 1 Pilot Group

<u>Age</u>	<u>Parity</u>	<u>Gestation</u>	<u>Occupation</u>	<u>Full- time education -age left</u>	<u>Graduate Status</u>	<u>Marital Status</u>	<u>Ethnic Origin</u>
29	Multiparous	29 weeks	Speech & Language Therapist	24	Yes	Married	White/ British
16	Nulliparous	39 weeks	Student	Still attending	No	Single	Mixed Race
29	Nulliparous	39 weeks	Teacher	21	Yes	Married	White/ British
28	Nulliparous	31 weeks	Travel Consultant	18	No	Married	Mixed Race
37	Multiparous	23 weeks	Housewife	15	No	Living together	White/ British

Procedure:

An opportunity sample of pregnant women, attending for routine antenatal care at a Midwife-Led Unit, was invited to participate within the pilot study. The venue was chosen as the atmosphere is calm and there are quiet, private and relaxing rooms available that can be used for interviews, with prior booking. As suggested by Clarke-Carter (2001) the precise concept being investigated was not divulged, the women were asked if they would participate in a study to validate a questionnaire about their feelings regarding their pregnancy and their growing baby. The women were approached as they arrived at antenatal clinic and asked if they would participate in the pilot study at the end of their consultation. It was explained that for a pilot study it takes longer than simply completing the questionnaire, as it also involved a short interview and that if they wished to participate it would take approximately 40 minutes. A written information

sheet was given to the women to supplement the conversation, giving the women time to make an informed decision regarding participation. Prior to completing the questionnaire a consent form was signed. A "double interview" technique was used - first the women completed the questionnaire in the privacy of the room, following which they were interviewed regarding usefulness of instructions, design and layout of the questionnaire, comprehension of the items and ease of completing. Also included as suggested by Rust & Golombok (2000) was that each participant was asked to rationalise why they had chosen a particular option and whether more choices or different choices would have been more appropriate.

Results:

The women reported no problems completing the psychometric tool. They had found the instructions clear, the items unambiguous and the options sufficient and explicit. They did however highlight problems with the final page which includes biographical information and questions on inter-generational attachment:

- Questions needed numbering for identification and clarity.
- Question 9 that gave a rating scale was answered easily following some consideration.
- However Questions 8 and 10 the respondents found difficult to answer.

As it was difficult to quantify without any clear rating scale or

guidelines. Question 8 was answered in a variety of ways - very good, very close, OK, excellent, great. Question 10 also provided many disparate answers - quite a lot, now and again, 8, very often, not very often. The data was ambiguous and difficult to analyse with an objective interpretation. Therefore it was decided that for all these questions a rating scale of 0 - 10 would be provided with both end of the continuum given a definitive value. Question 10 was also vague, so the question was re-worded and a time-frame given to help focus the participant.

Draft 4 (Appendix Six) of the maternal-fetal assessment tool was produced.

Stage 2

Materials:

Following stage one, comments were analysed and appropriate revisions made to the questionnaire. Draft 4 of the self reported maternal-fetal assessment psychometric tool was piloted. A "double interview" method was used for data collection.

Participants:

The participants were an opportunity sample of five pregnant women attending for the Midwife-Led Unit for routine antenatal care (Table 21). All women were within the second or third trimester of pregnancy, gestation

ranged from 17 - 37 weeks pregnant. Age ranged from 21 - 37 years old. Two participants were in co-habiting relationships and two were married. One participant was single, her partner choosing not to be involved within the pregnancy after initially appearing pleased. All participants classified themselves as White/British.

Table 21: Biographical details of participants in Stage 2 pilot study

<u>Age</u>	<u>Parity</u>	<u>Gestation</u>	<u>Occupation</u>	<u>Full- time education -age left</u>	<u>Graduate Status</u>	<u>Marital Status</u>	<u>Ethnic Origin</u>
35	Nulliparous	26 weeks	Water Quality Regulatory Officer	22	Yes	Living together	White / British
21	Nulliparous	27 weeks	Waitress	16	No	Single	White / British
37	Multiparous	37 weeks	Victim Support Officer	17	No	Living together	White / British
34	Multiparous	37 weeks	Marketing Manager	22	Yes	Married	White / British
31	Nulliparous	17 weeks	Human Resources Advisor	21	Yes	Married	White / British

Procedure:

Following analysis, revision and production of Draft 4 of the maternal-fetal assessment tool an appointment was made to attend a community antenatal clinic at the Midwife-Led Unit and a room booked to facilitate the interviews. The antenatal clinic was peaceful, with a calm unhurried approach to care, which was provided by the women's named community midwife. The procedure followed emulated the procedure for the first face validity pilot study.

Results:

Three of the five women found the questionnaire easy to complete. The instructions were explicit, the questions easy to understand and the options appropriate to their needs. Two women however found deficiencies:

- One participant stated that although her pregnancy had been planned by her partner and herself, the reality and responsibility of a viable pregnancy had terrified him and he had ended the relationship. She felt that question 6 did not truly reflect this situation and suggested an option was included that stated that the participant was no longer with their partner. This had also been the case for some of the interviewed participants. It was therefore considered not an isolated incident and an important point, as it related directly to the question of support. Therefore option 1 (totally overwhelmed) was deleted and replaced by "I don't have a partner".
- Another participant stated that question 17 was a leading question - it suggests that all women should make dietary changes to accommodate the needs of the fetus. On reviewing the question this was indeed the case. It would have led to women possibly give the socially mediated response and not be representative of their behaviour. This resulted in both the item and the majority of the options being changed.

Following revision of the maternal-fetal attachment psychometric questionnaire, Draft 5 (Appendix Seven) was produced. A Users Guide and Scoring Sheet were produced to support the questionnaire (Appendix Seven).

8.1: Submission for Ethical Approval

A submission was made to the Local Research & Ethics Committee and the National Health Service Trust Research & Development Department for Phase II of the study. A full explanation of the next Phase of research was presented together with the proposed psychometric tool and the tool it would be measured against for validity. There would be 2 rounds of data collection and analyses - for reliability and validity. Approval was granted (Appendix Eight). Following approval permission was again sought from the "Gate-Keepers" - Head of Midwifery Services and Lead Obstetrician. The Lead Midwives in areas where data would be collected were also informed about Phase II of data collection in order to facilitate data collection at the most appropriate times with the least possible disruption to services.

Chapter Nine

Phase Two - Quantitative Research

Quantitative research is a highly structured investigation involving some form of numerical measurement and statistical analysis. It utilises the "scientific approach" to inquiry; this can be defined as a systematic investigation that aims to develop knowledge about a naturally occurring phenomenon (Polit & Hungler, 1995). Scientific research is characterised by an orderly and logical approach, the control of confounding and biasing variables and the collection of empirical evidence which culminates in the capacity to generalise the research findings to the target population. There are two basic assumptions in scientific research - objective reality and determinism (Creswell, 2003). Objective reality refers to the assumption that nature is basically orderly, regular and consistent and is therefore capable of measurement. Simply determinism refers to the assumption that all phenomena have antecedent causes. It is therefore possible to explore the inter-relationship between cause and effect in order to discover new knowledge (Creswell, 2003). A definition of maternal-fetal attachment has been generated through qualitative methodology and this definition is going to be tested through quantitative research. The hypothetico-deductive

approach has been used to test this definition; through survey methods data was collected and evaluated to provide more observations to support or challenge the emergent theory.

Phase Two involved the validation of the newly developed psychometric questionnaire to assess maternal-fetal attachment. The tool was tested in two stages, round one for reliability and round two for validity. The reliability of a psychometric tool is a measure for assessing its quality and adequacy. Reliability is the estimate of the degree of consistency and level of accuracy afforded by the questionnaire. The reliability of the tool was assessed through measuring stability and internal consistency. Stability refers to the degree to which the same results are obtained on repeated administration of the tool. This is done through measuring test-retest reliability; the tool is administered to the same sample on two occasions and their scores compared. Internal consistency measures the extent to which all items within the tool measure consistently the critical attribute - maternal-fetal attachment. To measure internal consistency traditionally a split-half test is done. The items are split into two groups, scored independently and the scores of the two half-tests correlated. Following testing for the usefulness of the instrument through reliability the tool was assessed for validity. Validity refers to the extent the instrument measures what it claims to measure. There are several inter-related forms of validity that should be measured - face, content,

criterion and construct. Face validity and content validity have been assessed as being appropriate at the pilot stage of development. Round two assessed criterion and construct validity. Within the study criterion validity was assessed through measuring concurrent validity. This assesses the extent to which the new test produces similar results to an existing validated instrument measuring the same concept. Construct validity was measured through testing homogeneity (how well the new tool consistently measures the concept) and convergence (how well the new test produces similar results to a validated test).

9.1: Cohort One: Reliability

Materials

The Maternal-Fetal Attachment Tool (MFAT) (Appendix Seven - Draft 5 MFAT) generated from the pregnant women's perspective of attachment was administered to women in their second and third trimester of pregnancy to test the instrument for reliability. The definition of attachment was used as a framework for the questionnaire. The items were developed from the 6 key concepts and important themes that emerged from analysis of the qualitative data. The psychometric tool consists of 22 items; 18 are generic, to be answered by all participants; 2 items are specific to primigravid participants and 2 items are specific to multiparous women. The participants

therefore each answer 20 questions. The items are followed by four option-ranked alternative statements; the participants are instructed to tick whichever of the four statements is closest to their own feelings.

Following the MFAT are a series of ten questions. Questions 1 - 7 refer to biographical data that would aid interpretation of the psychometric tool and further add to the data relevant to the development of maternal-fetal attachment. Questions 8 - 10 relate specifically to inter-generational attachment, to give greater insight into this concept that all participants within the qualitative phase of the research had identified as important. These three questions would not form part of the final questionnaire, they are adding further to the data to aid understanding of the multi-faceted concept of maternal-fetal attachment.

Participants

An opportunity sample of 200 women in the second and third trimester of pregnancy participated within the study. Although opportunity sampling was chosen, it was important to ensure that both primigravid women and multiparous women were represented within the sample. It was decided that women within the second and third trimester of pregnancy would be approached to participate within the study as they have more experiences of the developing fetus and budding attachment that would provide a rich source of data. The women were attending antenatal clinics held within the

community, the Midwife-Led Unit and the District General Hospital, giving a broad and representative sample of the women seeking care within a medium sized, mixed urban and rural Trust. Women have the choice regarding the type of care they wish to receive from the maternity services. However all women with complications and the majority of primigravid women are recommended to have consultant obstetrician-led care at the District General Hospital. Most women receive most of their antenatal care from their named midwife within the community.

The size of the sample was chosen based on power calculations recommended by Cohen (1988), who suggests a minimum power level of 0.8 (with 20 questions per participant and a recommendation of 10 participants per question (Clarke-Carter 2001), the minimum number of participants to achieve an appropriate statistical power is 160). Two hundred women participated to assess internal reliability. To statistically assess external reliability through test-retest reliability coefficient a sub sample of 100 women - 50 primigravid and 50 multiparous women were administered the test on 2 occasions at least a fortnight apart. It is suggested by Kline (1993) and supported by Nevill, Lane, Kilgour, Bowes and Whyte (2000) that for meaningful statistical power calculations at least 100 participants take part in the study.

Of the sample of 200 pregnant women, 90 were primigravid and 110 multigravid; 9% were within the second trimester and 91% were within the final trimester of pregnancy (Figure 5 shows number of weeks the participants were pregnant).

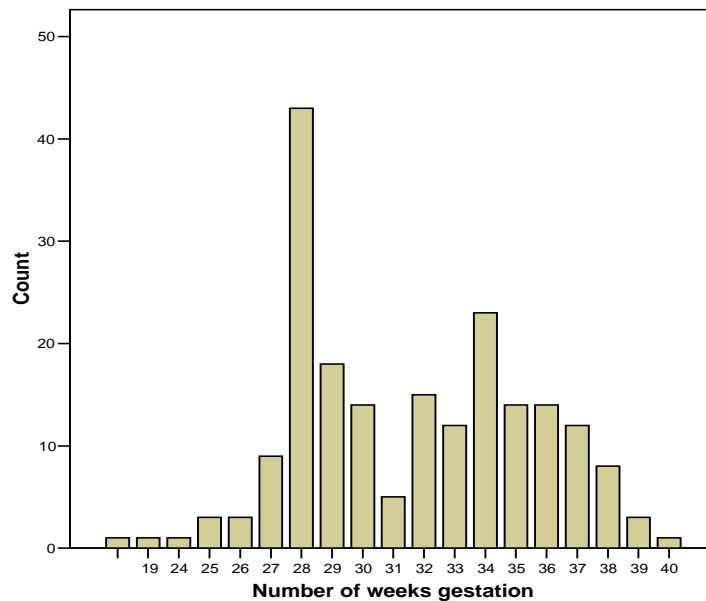


Figure 5: Gestation of Participants (n = 200)

Due to the population served by the Trust the majority of the participants were White / British. On this questionnaire the women were asked to describe their ethnic origin, no choices were given - 86.5% described themselves as White / British, 5.5% as Pakistani, 3.5% as Black / British, 2.5% as White European, 0.5% as Indian, 0.5% as Mixed Race, 0.5% as White / Irish and 0.5% as Philippino. The women's ages ranged from 15 to 41 years old (Figure 6 shows participants' ages).

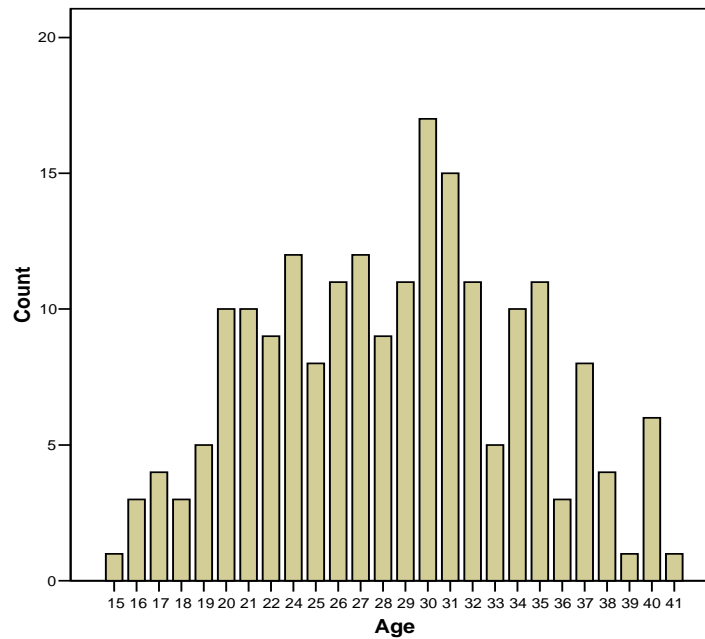


Figure 6: Ages of participants (n = 200)

The majority of the pregnant women were in co-habiting relationships - 58% were married, 32.5% living together, 8.5% single, 0.5% were separated and 0.5% divorced. The women were asked to state their occupation and this was plotted against the Standard Occupation Classification 2000 (SOC 2000) (Figure 7 showing the participant's occupation on SOC 2000).

The majority of the participants completed full-time education at 16 years old (Figure 8: Age participants completed full-time education). 41.5% stated they had completed full-time education by 16 years old, 27% had finished by 18 years old, and 8.5% appear to have attended some form of further education and 23% were graduates, with some completing as mature students.

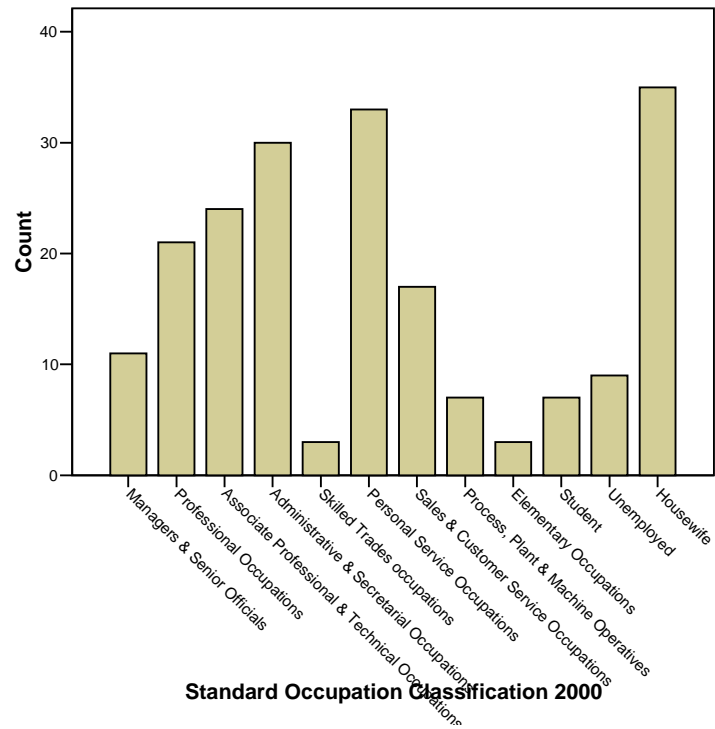


Figure 7: Occupation of participants (SOC 2001) (n = 200)

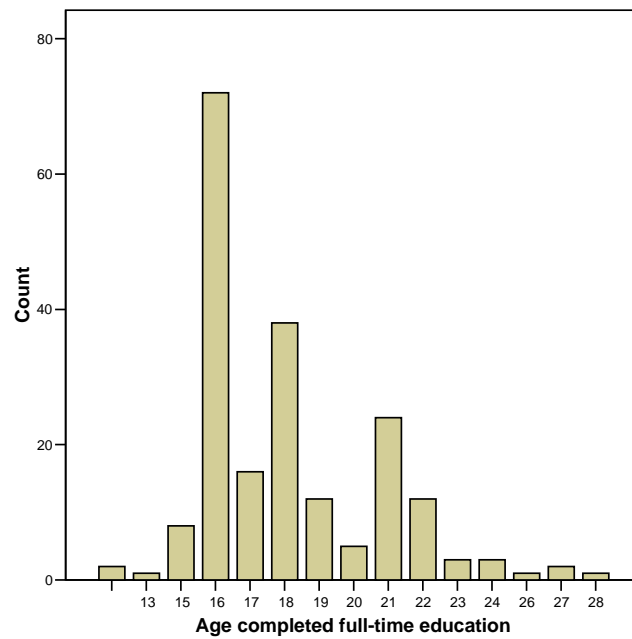


Figure 8: Age participants completed full-time education (n = 200)

The characteristics of the 100 women who participated in the test for external reliability reflect those within the larger cohort. 50 women were primigravid and 50 women were multiparous. The majority of the women were in the final trimester of pregnancy, gestation ranged from 19 - 40 weeks pregnant; 12% were within the second trimester of pregnancy and 88% in the third trimester. The majority of the participants described themselves as White / British (85.9%), 5.1% as Pakistani, 3% as White / European, 3% as Black / British, 1% as Indian, 1% as Mixed Race and 1% as Philippino. The women's age ranged from 15 - 40 years old; 10% were teenagers, 45% aged 20 - 29 years old, 42% 30 - 39 years old and 3% aged 40 years old. Of the cohort the majority of the women were within co-habiting relationships (92%); 65% were married, 27% living together and 8% single. However more of this cohort described their occupation as managers, professionals or associate professionals (Figure 9).

Within the cohort of 100 there were also differences regarding the age the participants left full-time education (Figure 10) and graduate status, with fewer women completing education at 16 and 18 years old; 31% completed at age 16 years old, 28% by 18 years old, and more graduates (34%).

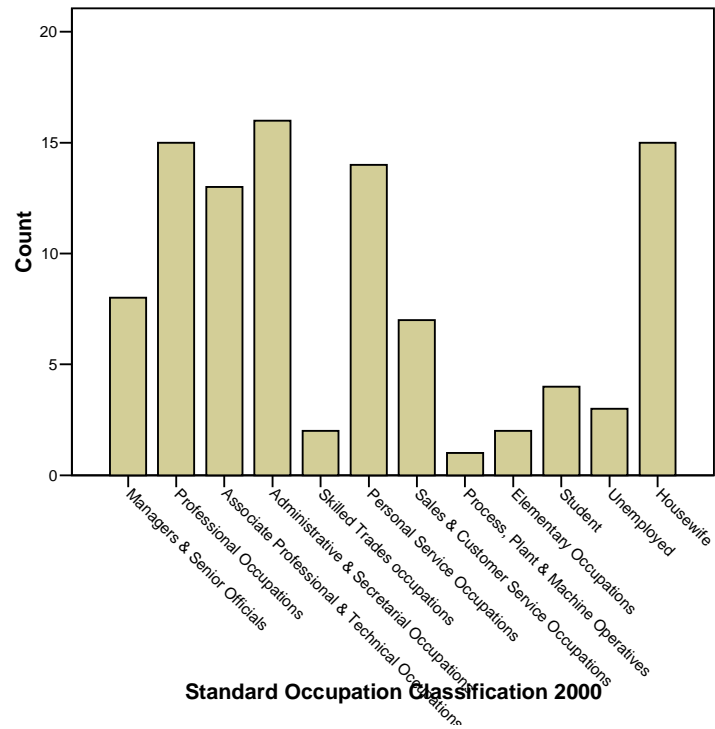


Figure 9: Occupation of participants (SOC 2001) (n = 100)

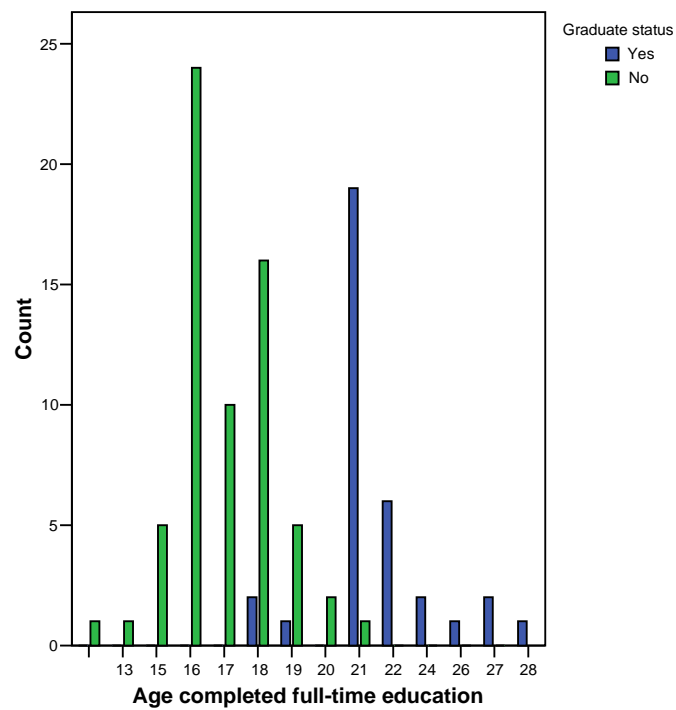


Figure 10: Age completed education and graduate status (n = 100)

Procedure:

The study was discussed, together with data collection and the effects this may have on the routine of antenatal clinic with the Lead Midwives for Community, the Midwife-Led Unit and the District General Hospital. Busy clinics were targeted to optimise the recruitment of participants. The midwives running the clinics were approached, the study was explained and the best clinics to target identified. It was decided that the researcher would actively take part in administering the questionnaire.

It is suggested by Hayes (2001) that if the researcher personally hands out the questionnaires it will increase the response rate, as the participants are more motivated to respond. The researcher is on hand to discuss any queries and respond to points made by the participants. This has a positive effect on the response rate and provides a richer data source as some participants wish to discuss and qualify their responses. The participants enthusiasm is enhanced when the questionnaires are administered within the clinical setting with the participants motivated to take part as they have a vested interest in the condition that is being tested (Polit & Hungler, 1995). The women were sampled within antenatal clinic as the most convenient place to encounter a large enough sample.

For external reliability two questionnaires need to be completed by each participant, at least two weeks apart. This meant that if the women were not

returning to antenatal clinic within that time-frame, the second questionnaire needed to be returned by post. Hayes (2001) identified that response rates from a postal questionnaire are notoriously poor at between 20 - 30%.

Indeed postal returns did prove problematic, significantly reducing the response rate and necessitating a protracted data collection period in order to achieve a sufficient sample. As there were fewer responses from primigravid women, to achieve a balanced 50 / 50 sample of primigravid and multiparous women of significant statistical power, data collection continued until a sample of 50 primigravid women was achieved.

Community based and hospital clinics were targeted in 3 towns within the National Health Service Trust. Pregnant women within the second and third trimesters of pregnancy were sought as the target population. This group was chosen as they had greater experience of pregnancy, with most women being more than 30 weeks gestation. After the women had booked into antenatal clinic and had made themselves comfortable they were approached to participate within the study. It was explained that a questionnaire was being tested, which would be used to find out women's feelings towards their pregnancy. It was highlighted that to assess whether the questionnaire was consistent over time, the same questionnaire needed to be completed by the same participant on 2 occasions at least 2 weeks apart. The second questionnaire could either be returned to the researcher in the stamped

addressed envelope provided or taken to clinic on their next visit. The researcher left folders at the clinics where the midwives could put any completed forms to await collection by the researcher. Following an explanation the women were given sufficient time to read an information sheet. They were then asked if they wished to participate. Those that assented completed a consent form. The consent form had no identifying numbers so could not be linked to any of the numbered questionnaires, thus providing anonymity to the participants. They were then asked if they had any questions and given 2 numbered questionnaires together with a stamped addressed envelope for the return of the second questionnaire. The majority of the women had time to complete the first questionnaire whilst they were awaiting their appointment with the clinicians for their antenatal examination and returned the first questionnaire before they left clinic. Questionnaires were numbered in pairs and marked a. and b. so they could be collated for analysis. 230 completed first questionnaires were collected; 133 second questionnaires were fully completed and returned, giving a response rate for the second questionnaire of 57%.

Data Analysis:

The first stage in validating a psychometric tool is to statistically measure reliability. Reliability is the estimate of the degree of consistency

and level of accuracy afforded by the questionnaire. The reliability of the tool was assessed through measuring stability and internal consistency. Stability or external reliability refers to the degree to which the same results are obtained on repeated administration of the tool. This is done through measuring test-retest reliability; the tool is administered to the same individual on two occasions and their scores compared. Internal consistency or internal reliability measures the extent to which all items within the tool measure consistently the critical attribute - maternal-fetal attachment.

Internal reliability:

- Split-half reliability - this is a numerical measure of the index of association between two sets of scores. This is the simplest form of testing, which correlates performance on two halves of the test; measuring whether the items in each half of the test are consistent with each other. Pearson's correlation coefficient can be used for this purpose. However this measurement of reliability is affected by the number of items within the tool; the more items the greater the reliability. Therefore Spearman and Brown will be used to measure reliability as it makes an adjustment to allow for smaller number of items.

- Cronbach's coefficient alpha - Clarke-Carter (2001) recommends this test, stating it is more effective in providing statistical evidence of reliability as it tests every possible combination of split-half items. An alpha value of at least 0.7 is generally accepted as evidence of reliability (Kline, 1993; Clarke-Carter, 2001)
- Factor analysis allows sense to be made of complex data generated by a questionnaire. It seeks out the pattern of variables between questions; it allows analysis of a matrix of correlations generating a much smaller set of "super-variables" which characterise the main trends within the questionnaire (Howitt & Cramer, 2000).

External reliability:

Test - retest reliability coefficient

- Pearson's correlation coefficient. It is suggested by Kline (1993) that at least 100 participants are used and that to demonstrate reliability ideally an r value of at least 0.8 is necessary. Kline also recommends 3 months between test/retest. When this is not possible it is suggested that Pearson's correlation coefficient is supported by a further test for reliability. In this study the more sensitive Percentage / Proportion of Agreement test has been used as support. In the special circumstances of this study it is impossible to wait 3 months as the women will have birthed their babies. Nevill *et al.* (2000) have clearly

demonstrated that when circumstances necessitate the test/retest can successfully be conducted within 2 weeks.

- Proportion / Percentage of Agreement Test (PA test). Nevill *et al.* (2000) identified that Pearson's correlation coefficient measures relationship rather than agreement; for a more robust and sensitive test the PA test is recommended. The PA test measures the proportion of agreement, the proportion of participants that record the same response to an item on test - retest. Nevill recommends that for effective external reliability 90% of participants should record test - retest differences within a reference value of +/-1.

Testing the definition of attachment:

- Two-way analysis of variance (ANOVA) for unrelated / uncorrelated scores - to test the hypotheses that marital status and parity affect the women's attachment scores.
- One-way unrelated / uncorrelated ANOVA and Multi Comparison Post Hoc Tests to test the hypothesis that attachment is developmental and therefore the women's attachment score is affected by gestation.
- Correlations, Pearson's and Spearman Rho - to test the hypothesis that positive relationships with the women's parents has a positive affect upon the women's maternal-fetal attachment score.

- Descriptive statistics (frequencies) were used to explore the women's responses to specific questions on the questionnaire. This explored the hypotheses that maternal fetal attachment is developmental; the main maternal emotion to the fetus is protection and that as a result of the maternal need to protect their unborn child the woman will alter her behaviour to provide a favourable intra-uterine environment.

Descriptive statistics were also utilised to explore the affects of already being a mother on the women experience the current pregnancy.

These tests are used to test the definition of maternal-fetal attachment for Cohort 1 (n = 200) and Cohort 2 (n = 150).

9.2: Cohort Two Validity

Materials:

The revised MFAT (Appendix Nine Final Questionnaire, Draft 6 and User Guide) was administered to the participants together with Condon's (1993) validated Maternal Antenatal Attachment Scale (Appendix Ten). The revised MFAT consisted of sixteen generic items to be answered by all participants, one specific item for primigravid women and one for multiparous women; all women answered seventeen items in total. Each item was followed by option-ranked alternative statements, of which the participant was asked

to tick which statement most closely reflected their own feelings. The questionnaire concluded with eight biographical questions and three questions on intergenerational attachment. These were to inform data analysis, to provide a richer data source and were not included within the generated maternal-fetal attachment tool.

In order to statistically test concurrent and construct validity an existing validated tool measuring the same construct was administered at the same time. Condon's Maternal Antenatal Attachment Score (MAAS) (1993) was used (Appendix Ten). Condon (1993) stated that there is no universal definition of maternal-fetal attachment, and as a result based his tool on a hierarchical theory of adult attachment. The MAAS tool consists of nineteen items, followed by a bi-polar five category likert scale.

Participants

An opportunity sample of 150 women in the third trimester of pregnancy participated within the study. Although opportunity sampling was chosen, elements of purposive sampling were evident. The women needed to be within their third trimester of pregnancy to ensure there was homogeneity within the cohort each with sufficient experiences of pregnancy to make valid contributions. There also needed to be representation from both primigravid and multiparous women. The women were sampled during their routine attendance at antenatal clinic; women were sampled from clinics held within

the community, the Midwife-Led Unit and the District General Hospital, giving a broad and representative sample of the women seeking care within a medium sized, mixed urban and rural Trust.

The size of the sample, of 150 participants, was chosen based on power calculations recommended by Cohen (1988), who suggests a minimum power level of 0.8. It is recommended that for sufficient statistical power there should be 10 participants per item, with 17 items the minimum number of participants for meaningful results is 136 (Clarke-Carter, 2001).

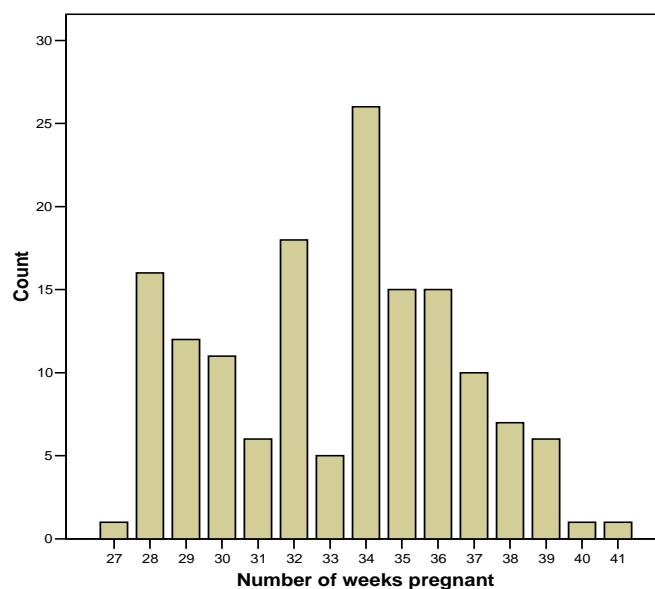


Figure 11: Number of weeks women pregnant (n = 150)

Of the 150 participants, 61 were primigravid women and 89 multiparous women. All women were within the final trimester of pregnancy with gestation ranging from 27 to 41 weeks pregnant (Figure 11). The majority of the women were in co-habiting relationships 58% married, 32% living with their partner, 9.3% single and 0.7% separated.

The women reflected the ethnic mix within the study area. 78.7% were white British, 7.3% White European, 4.7% Black British, 4.7% Pakistani, 0.7% Black Caribbean, 0.7% Indian and 0.7% Turkish. The women's ages ranged from 15 - 42 years of age (Figure 12). Of the 150 women 7.3% were teenagers, 44% were aged 20 -29, 47.5% were 30 - 39 years old, one participant was 41 years old and one participant was 42 years old.

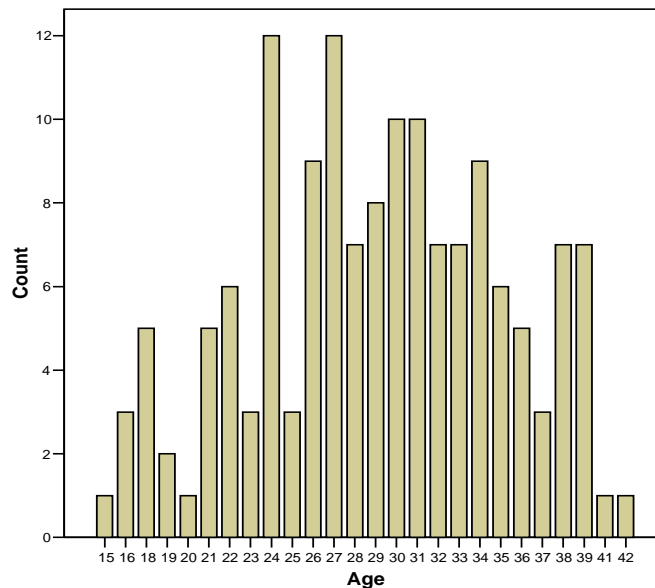


Figure 12: Age of the participants (n = 150).

The sample of 150 had similar educational profiles to the previous sample - 40.7% completed full-time education at 16 years old, 43.3% completed full-time education at 18 years old and 24% were graduates (Figure 13).

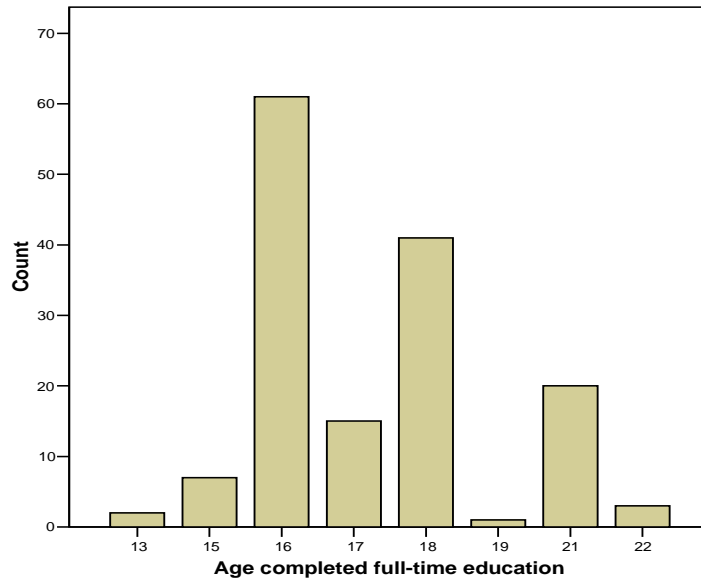


Figure 13: Age participants completed full-time education (n = 150)

Unlike the previous sample, this cohort had more diverse occupations.

Although 30.7% described themselves as managers, professionals or associated professionals and 16.7% describes themselves as house-wives (Figure 14).

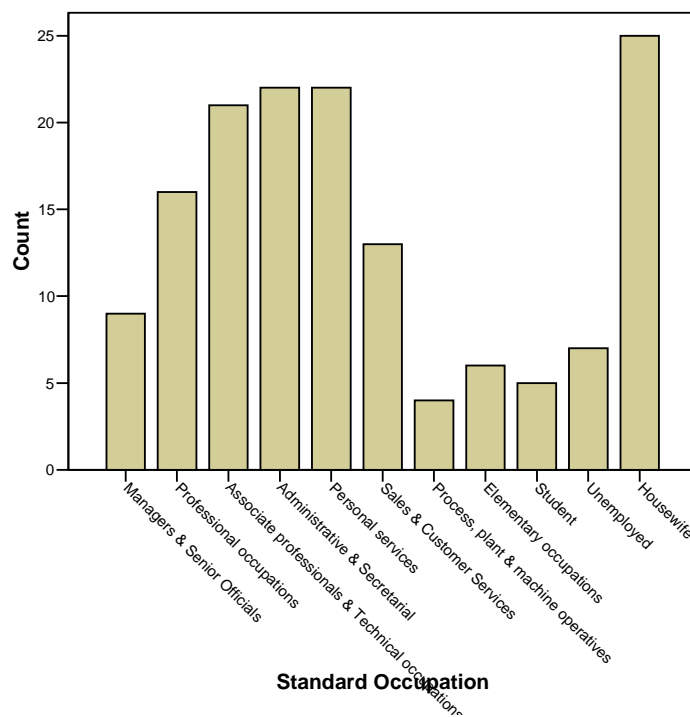


Figure 14: Occupation of participants (SOC 2001) (n = 150)

Procedure:

The second round of data collection was discussed, with the Lead Midwives for Community, the Midwife-Led Unit and the District General Hospital. Busy clinics were targeted to optimise the recruitment of participants. Data were collected from pregnant women attending community based and hospital antenatal clinics for routine antenatal care within the Trust. Three towns were targeted to provide a representative sample of the target population served by the Trust. To ensure a homogeneity the sample targeted were primigravid and multiparous women all within the final trimester (27weeks - term) of pregnancy. Following the experiences of the first round of data collection and the benefits of the researcher being available to discuss the research with the participants, it was decided that the researcher would actively take part in administering the questionnaire. Following discussion of the research, the midwives within the clinics also helped with data collection.

To statistically analyse concurrent and construct validity data needed to be collected simultaneously from the new tool and an already validated tool testing the same paradigm; Condon's (1993) Maternal Antenatal Attachment Score (MAAS) was chosen for comparison. After the women had booked into antenatal clinic and had made themselves comfortable they were approached to participate within the study. It was explained that a questionnaire was

being tested, which would be used to find out about their feelings towards their pregnancy and that in order to test statistically that the tool was testing the concept it professed to the new tool needed to be completed at the same time as an existing tool measuring the same subject. The women were told it would take approximately fifteen minutes to complete the questionnaires. Following this explanation the women were given sufficient time to read an information sheet, they were then asked if they wished to participate, those that assented completed a consent form. The consent form had no identifying numbers so could not be linked to the numbered questionnaires. The women had time to complete the questionnaire whilst they were awaiting their appointment with the clinicians for their antenatal examination and returned the questionnaire before they left clinic. Response rate was 97%.

Data Analysis:

Round two of data analysis was to assess the validity of the proposed tool. Validity assesses whether the tool consistently measures the construct it purports to measure. Cohen, Swerdlik & Philips (1996) state that new psychometric tools should be scrutinised through statistical analysis of the three main inter-related categorises of validity - content, criterion and construct. Content validity refers to the degree that the tool covers the full range of behaviours / emotions of the construct being measured. This was

successfully assessed and reported at the piloting stage. Criterion validity considers whether the psychometric tool fulfils certain criteria. It is an assessment of how adequately the test score can be used to infer an individual's probable behaviour. Traditionally criterion validity is defined as the correlation of a new scale with an already validated and respected measure of the same construct (Streiner & Norman, 1995). There are two forms of criterion reliability - concurrent and predictive; for this study concurrent validity was assessed. Concurrent validity measures the relationship between the proposed test and an existing validated tool when administered at the same time. Concurrent validity is accepted if the tools produce similar /related results. Construct validity assesses the theoretical construct upon which the tool is based and appraises the appropriateness of the tool to make judgements on the individual's position on that specific construct (Clarke-Carter, 2001). Construct validity was statistically assessed through measuring homogeneity and convergence. Homogeneity (internal consistency) refers to how well a tool consistently measures a single concept; convergence refers to evidence that the new test correlates with a validated test measuring the same construct. Internal reliability was assessed again following revision of the tool.

Criterion Validity:

- Concurrent validity was measured using Pearson's correlation coefficient. This measured the relationship between the new tool (MFAT) and Condon's (1993) MAAS when administered simultaneously.

Construct validity:

- Homogeneity was measured by exploring the correlation between MFAT and MAAS using Cronbach's coefficient alpha.
- Convergence was measured using Pearson's correlation coefficient

Internal reliability:

- Cronbach's coefficient alpha
- Factor analysis

Testing the definition of attachment:

- Two-way analysis of variance (ANOVA) for unrelated / uncorrelated scores
- Independent *t*-test; One-way unrelated / uncorrelated ANOVA and Multi Comparison Post Hoc Tests Correlations, Pearson's and Spearman Rho and Chi Square
- Descriptive statistics

Chapter Ten

Results

10.1: Testing the Tool for Reliability (Cohort 1)

Internal Reliability

Internal reliability is the extent to which all of the items within a psychometric tool are measuring the same concept. If the items are measuring a similar concept then each item should correlate with other items within the scale (Howitt & Cramer, 2000). Measures of internal reliability are based on a single administration of the tool; it is suggested by Rust & Golombok (2000) that when the questionnaire is intended for different types of participants, ideally data should be collected from a total of 200 participants. Within this study data from 200 pregnant women was collected, 110 multiparous women and 90 primigravid women within their second or third trimester of pregnancy.

1. Split-half reliability

For this statistical test 3 separate measures were taken from:

- the 18 generic items within the questionnaire that all participants answered (200 participants);

- the 20 items answered only by primigravid women (90 participants);
- the 20 items answered specifically by multiparous women (110 participants).

The split-half reliability for the 20-item scale specifically for primigravid women were 0.72 indicating that the scale is reliable in a person-based questionnaire; Clarke-Carter (2001) states 0.7 and above is indicative of good reliability. However the result for the 18 generic items, answered by all participants was 0.64 and the result for the 20 items answered exclusively by multiparous women was 0.61. This indicates weaker reliability. It is important to note, however, that although this scale measures attachment, it explores 6 important factors within attachment, which will affect the similarity of the items. It is further recommended by Clarke-Carter (2001) that Cronbach's Coefficient Alpha is more effective in providing statistical evidence of reliability as it tests every possible combination of split-half items.

2. Cronbach's Coefficient Alpha

This test was conducted similarly to the split-half test, with three separate measures taken. The alpha reliability for the generic 18-item scale was 0.67. This indicates weak reliability, as Kline (1993) and Clarke-Carter

(2001) state an alpha of 0.70 is the value accepted as evidence of reliability.

The alpha reliability for the 20 items answered exclusively by primiparous participants was 0.71 indicating that the scale has satisfactory reliability.

The alpha reliability of the 20-item scale answered exclusively by multiparous women was .67 indicating weak reliability (Appendix Eleven).

Before further testing of the questionnaire for reliability, attempts were made to increase reliability by deleting some items and re-assessing item - total reliability.

3. Factor Analysis

A principle axis factor analysis was conducted on the correlations of the 18 generic items within the Maternal-Fetal Attachment Tool (MFAT). Six factors were extracted with Eigen values equal or greater than 1.00, shown in Figure 15 Cattell's Scree Slope below. Orthogonal rotation of factors yielded the factor structure given in Table 22. Factor 1 accounted for 8.7% of variance; Factor 2 for 7.5%; Factor 3 for 6.5%; Factor 4 for 4.9%; Factor 5 for 4.8% and Factor 6 3.1% - cumulative total 35.59% (Results of factor analysis in Appendix Eleven). These factors appear to reflect the 6 themes identified from the qualitative phase of the research - factor 1 seems to be social support; factor 2 physical and emotional adaptation to the pregnancy;

factor 3 intimacy of pregnancy; factor 4 the developmental nature of attachment; factor 5 protection and factor 6 tentative pregnancy.

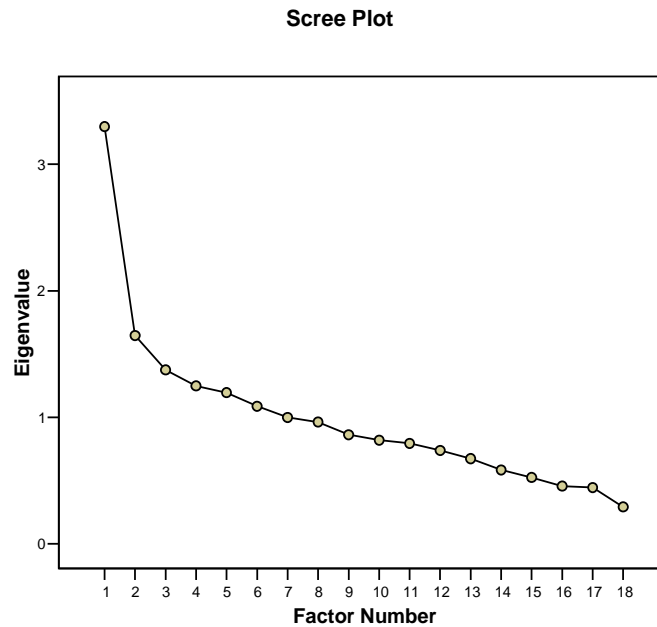


Figure 15: Cattell's Scree Plot, Round 1

Table 22: Orthogonal factor loading matrix for the 18 generic items.

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor6
6	0.863	0.058	-0.029	0.129	0.047	0.105
10	0.489	0.079	0.168	-0.143	-0.090	-0.041
1	0.439	0.186	0.046	0.013	0.006	0.278
15	0.297	0.240	0.203	0.034	0.268	0.266
8	0.069	0.700	0.022	-0.009	0.054	-0.191
11	0.139	0.464	0.252	0.171	0.126	0.021
3	0.199	0.385	0.193	0.034	0.035	0.193
16	0.069	0.336	-0.018	0.004	0.058	0.185
17	0.017	0.253	0.128	0.005	0.084	0.003
13	0.249	0.216	0.905	0.085	0.097	0.025
4	-0.017	-0.101	0.032	0.764	-0.012	-0.118
12	-0.085	0.214	0.07	0.321	0.017	0.078
14	0.036	0.149	0.029	0.175	0.002	0.002
5	0.364	0.167	0.205	0.218	0.578	0.007
7	-0.027	0.006	0.028	-0.169	0.468	-0.118
9	-0.153	0.208	-0.031	0.108	0.431	0.112
2	0.067	0.116	0.098	0.052	-0.089	0.411
18	-0.029	0.096	0.051	0.108	-0.036	-0.280

With factor analysis as interpretation of factors is idiosyncratic, differences in interpretation can occur (Howitt & Cramer, 1999). It should also be noted that many items load on more than one factor showing the multifactorial and interdependent nature of maternal-fetal attachment. Items 14 and 18 loaded poorly on all factors and therefore their inclusion within a revised questionnaire should be reviewed for efficacy.

External Reliability

Test-retest reliability - these are statistical tests (Pearson's correlation coefficient and percentage proportion of agreement test) that assess whether the items within the questionnaire are consistent over time.

100 women (50 primigravid, 50 multiparous) within the second or third trimester of pregnancy completed the questionnaire on 2 occasions at least 2 weeks apart.

1. Pearson's correlation coefficient

It is suggested by Kline (1993) that to demonstrate reliability ideally an r value of at least 0.8 is necessary. There was a significant positive relationship with questionnaire results when administered at time 1 and time 2 ($r = 0.91$, $df = 98$, $p < 0.001$). This statistically demonstrates that there is

external reliability / stability of the items within the questionnaire with a significant proportion of the women answering the items in the same manner.

Individually 8 items on test-retest achieved an r value of between 0.8 - 0.98, $df = 98$, $p < 0.001$; 8 items score an r value of between 0.7 - 0.79; 5 items have an r value of 0.64 - 0.69; item 7 achieved an r value of 0.4. All items resulted in a positive correlation at the 0.01 level (2-tailed).

2. Proportion / Percentage of Agreement test (PA Test)

With this more robust and sensitive test, external reliability has been statistically confirmed. Nevill *et al.* (2000) recommend that for effective external reliability 90% of participants should record test - retest differences within a reference value of ± 1 . Items 1 - 21 all achieve at least 90% PA $\pm 1\%$ (Table 23), demonstrating that when each item is compared on test and retest there is stability. Item 22 did not achieve the accepted reference value (84%), suggesting this question is not reliable. However this question asks how multiparous women feel towards the developing baby, as most women were accompanied to antenatal clinic by their partners they may have given a socially mediated response rather than their true feelings, second completion was within their own homes so the women may have been alone and more able to answer autonomously. Also the fetus has developed further by the second test and that may have affected their view.

Table 23 - Results of Proportion / Percentage of Agreement

Item	PA +/- 1 (%)	PA (%)	Item	PA +/-1 (%)	PA (%)
1	99 (99)	91 (91)	12	94 (94)	79 (79)
2	95 (95)	78 (78)	13	100 (100)	75 (75)
3	100 (100)	90 (90)	14	98 (98)	95 (95)
4	99 (99)	87 (87)	15	100 (100)	80 (80)
5	100 (100)	90 (90)	16	98 (98)	84 (84)
6	100 (100)	99 (99)	17	94 (94)	77 (77)
7	99 (99)	88 (88)	18	97 (97)	77 (77)
8	97 (97)	84 (84)	19 Primip	98 (98)	72 (72)
9	92 (92)	72 (72)	20 Primip	98 (98)	78 (78)
10	98 (98)	86 (86)	21 Multip	96 (96)	80 (80)
11	99 (99)	76 (76)	22 Multip	84 (84)	72 (72)

n = 100(Items 1 - 18)

n = 50 (Items 19 -22)

In summary both Cronbach's Alpha coefficient and Split-half Reliability tests on the responses of 200 pregnant women to the Maternal-Fetal Attachment Tool (MFAT) demonstrated that the 20 items answered by primigravid women were reliable; however the generic items and the items answered by multiparous women indicated only weak reliability. Six factors

were extracted using Factor Analysis. This can be mapped against the six themes that underpin the definition generated from qualitative analysis of data. However, these themes account for only 35.2% of the variance within the questionnaire. This reflects the multi-dimensional assessment within the questionnaire. Many items load on more than one factor demonstrating that factors may be interdependent. External reliability was confirmed by administering the same questionnaire (MFAT) to 100 pregnant women (50 primigravid; 50 multiparous) on two occasions at least two weeks apart. Pearson's correlation coefficient showed a significant positive correlation between the questionnaire results time 1 and time 2. The results of the Proportion / Percentage of Agreement Test confirm good external reliability.

10.2: Testing the definition of maternal-fetal attachment: Cohort 1

Through analysis of the qualitative data collected by means of face to face interviews and focus group discussions, an account explaining maternal-fetal attachment from the women's perspective was formulated. This explanation has been summarised to produce the definition that acts as a framework for the Maternal-Fetal Attachment Tool that facilitates the interpretation of results.

From the quantitative data collected for both Cohort 1 and Cohort 2, during the validation of the Maternal-Fetal Attachment Tool, the following main components of the definition were further explored and tested to discover if these elements were indeed important within maternal-fetal attachment:

- Multiparity affects maternal-fetal attachment; women who already have children need to consider their existing children's needs.
- The stability of a partner type relationship is fundamental to the development of attachment.
- Emotional attachment is developmental in nature, prompted by perceptible physical evidence that the fetus is viable and growing.
- The quality of the woman's relationship with her parents and the provision of parental support promote and endorse the developing maternal-fetal attachment.
- That the essence of the relationship is based on the woman's inherent desire to protect her fetus

Within the cohort 23% were found to be poorly attached, 64% attached and 13% highly attached. Table 24 provides an overview of the results differing groups of pregnant women within the cohort scored on the Maternal Fetal Attachment Tool.

Table 24: Descriptive statistics of the results of MFAT scores (n = 200).

Participants	Number	Mean	Std. Deviation	Minimum Score	Maximum Score
Whole Cohort	200	43.22	6.11	23	55
Parity	200				
Primigravida	90	44.84	6.43	23	55
Multiparous	110	41.90	5.53	23	52
Gestation	200				
19 - 26 weeks	8	37.13	9.46	23	47
27 - 33 weeks	115	43.92	5.39	24	55
34 weeks - term	77	42.82	6.41	23	55
Marital Status	200				
Single	17	36.12	7.05	23	46
Married	116	44.85	5.22	24	55
Co-habiting	65	42.40	5.85	23	53
Separated	1	35.00			
Divorced	1	37.00			
Age (Years old)	200				
15 - 19	20	41.00	7.97	23	55
20 - 29	89	43.51	5.93	23	54
30 - 39	84	43.38	5.79	23	53
40 plus	7	44.14	6.25	39	55
Age completed FTEd	199				
16	82	42.33	5.79	23	53
18	69	43.96	6.22	23	55
21	27	44.19	5.90	30	55
21+	21	43.38	7.12	24	53
Graduate Status	200				
Yes	47	43.87	6.18	24	55
No	153	43.03	6.10	23	55
Standard Occupation Classification (2000)	200				
1	11	44.29	5.27	34	51
2	21	44.48	6.67	30	55
3	24	44.75	5.30	35	55
4	30	43.43	4.63	35	52
5	3	36.00	13.00	23	49
6	33	43.27	5.21	33	53
7	17	43.18	7.12	24	51
8	7	42.86	8.55	30	51
9	3	47.00	4.58	43	52
Student	7	38.43	7.79	23	45
Unemployed	9	40.22	5.63	30	47
Housewife	35	43.00	6.25	23	53
Ethnic Origin	198				
White British	172	42.87	6.32	23	55
White European	5	41.80	2.39	39	45
Black British	6	45.00	4.43	39	49
Pakistani	11	46.91	4.68	37	53
Indian	1	47.00			
Mixed Race	1	47.00			
Irish	1	42.00			
Philippino	1	49.00			

One-way ANOVAs showed no significant effect on the maternal-fetal attachment assessment score for ethnic origin ($F_{7,190} = 0.996, p = > 0.05$); social group ($F_{11,188} = 1.355, p = > 0.05$); age ($F_{3,196} = 1.016, p = > 0.05$) or age completed full-time education ($F_{3,195} = 1.143, p = > 0.05$). An independent sample *t*-test showed that graduate status also had no significant effect on MFAT score ($t = 0.82, df = 197, \text{two-tailed } p = > 0.05$).

1. Parity and marital status have an effect on maternal-fetal attachment.

The responses of the 200 pregnant women who completed the questionnaires were compared to discover the effects that parity and marital status had on the attachment score. A two-way unrelated ANOVA showed that both parity and marital status significantly explain the variance within the maternal-fetal attachment score. There was a relationship between parity and attachment score ($F_{1, 193} = 11.78, p = < 0.001$), primigravid women scoring higher; and there was a significant positive relationship between marital status and attachment score ($F_{3, 193} = 16.36, p = < 0.0001$), married women scoring higher. There was no interaction between parity and marital status upon the maternal-fetal attachment score ($F_{2, 192} = 0.28, p = > 0.05$) which suggests that these factors act independently on the dependent variable.

Table 25: Analysis of variance summary table showing the effect of parity and marital status on MFAT score (n = 200)

Source of variation	Sum of Squares	df	Mean Square	F	Sig.
Parity	340.025	1	340.025	11.786	.001
Marital Status	1415.640	3	471.880	16.356	.000
Parity with Marital Status	16.297	2	8.149	0.282	.754
Error	5568.026	193	28.850		

2. The women's emotional attachment to the developing fetus is affected by the presence of siblings.

The Maternal-Fetal Attachment Tool (MFAT), (Question 22) specifically asks multiparous women if their existing family has affected their experience of the current pregnancy (*Would you say that already having a family has influenced your decisions and your experiences of this pregnancy?*). 97.3% of multiparous participants (n = 110) stated that the experience of their current pregnancy had been influenced by their existing family commitments, although 64.5% stated that *their feelings towards their developing baby were as strong as they had been during their first pregnancy* (Question 21). It would appear that although the multiparous women believed their feelings were similar, the influence of existing children was affecting the attachment score.

An independent samples *t*-test found the mean MFAT score for primigravid women ($M = 44.84$; $SD = 6.43$) was significantly higher ($t = 3.49$, $df = 198$, two-tailed $p = < 0.001$) than for multiparous women ($M = 41.90$; $SD = 5.53$). It can therefore be concluded that primigravid women appear to have a greater attachment to their fetuses than multiparous women.

3. The continued social support of a partner type relationship has a positive effect on maternal-fetal attachment.

An unrelated one-way analysis of variance demonstrated that there was a significant effect of the independent variable *marital status* on the dependent variable MFAT score ($F_{3,196} = 14.03$, $p = < 0.0001$).

Table 26: Analysis of variance summary table showing the effect of marital status on MFAT score ($n = 200$).

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1315.002	3	438.334	14.029	.000
Within Groups	6123.873	196	31.244		
Total	7438.875	199			

Scheffe's range test showed that the MFAT score for married women was significantly higher than from single women ($p = < 0.0001$) and from those women in co-habiting relationships ($p = < 0.05$); it was also found that the MFAT score for co-habiting women was significantly higher than that of

single women ($p = < 0.0001$). Married women scored higher than both women in co-habiting relationships and single women. The consistent and continuing support within a partner-type relationship had a positive effect on MFAT score, promoting maternal-fetal attachment. Marital relationships have the greatest positive effect on maternal-fetal attachment.

4. Maternal-fetal attachment is developmental in nature.

The responses to question 4 on the Maternal-Fetal Attachment Tool (MFAT) are shown in Figure 16 below. 95.5% of women stated that they thought of the pregnancy as "*a real little person*" by the time the fetus made definite kicking movements during the second trimester of pregnancy. The events, identified within the questionnaire, occur chronologically within the first two trimesters of pregnancy; this suggests that attachment although progressive within the first and second trimesters, gradually becomes constant for the majority of women in the final trimester of pregnancy. It also demonstrates that attachment develops with evidence of fetal tangibility. It can therefore be theorised that the MFAT score will be affected by the number of weeks the woman is pregnant.

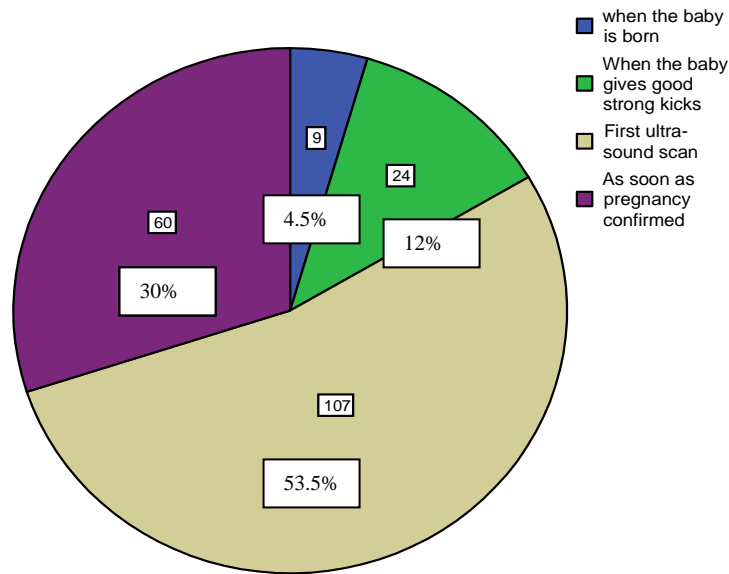


Figure 16: Responses to question 4 - When did you first think of the pregnancy as a real baby - a real little person? (n = 200)

To test the effect of gestation, the 200 participants were divided into 3 groups for comparison: 19 - 26 weeks pregnant (second trimester of pregnancy); 27 - 33 weeks pregnant (third trimester of pregnancy) and 34 weeks to term (third trimester of pregnancy). A one-way unrelated ANOVA showed that overall gestation has a significant effect on maternal-fetal attachment score ($F_{2, 197} = 5.10, P = < 0.01$), Table 25 below. Scheffe's range test found that the MFAT score for 19 - 26 week gestation was significantly lower than scores both at 27 - 33 weeks gestation ($p = < 0.01$) and 34 weeks gestation to term ($p = < 0.05$). There were no significant differences in the

maternal- fetal attachment score between 27 – 33 weeks gestation and 34 weeks gestation to term.

Table 27: Analysis of variance summary table showing the effect of gestational period on MFAT score (n = 200).

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	366.250	2	183.125	5.10	.007
Within Groups	7072.625	197	35.902		
Total	7438.875	199			

This suggests that although maternal fetal attachment is developmental within the first two trimesters of pregnancy it appears to remain fairly constant within the final trimester.

5. The quality of the woman's relationship with her parents has a positive relationship with maternal-fetal attachment.

The responses given to the questions (9 – 11) on intergenerational attachment that was additional and supernumerary to the Maternal-Fetal Attachment Tool provided the following results:

- a. *How would you describe your relationship with your parents?*

Distant 4.5%; Tolerated 10.5%; Close 32%; Very Close 52.7%

- b. *How much do you believe that your experiences in childhood have influenced you as an adult?*

Not at all 1%; Somewhat 7.5%; Significantly 53%; Greatly 38.5%

- *How often in the last month have you thought about your own childhood and your relationship with your parents?*

Never 20.5%; Occasionally 23.5%; Weekly 38.5%; Daily 17.5%

These results indicate that the majority of the participants had a close relationship with their parents (85%); that there was a widely held belief that childhood experiences influence life as an adult (91%) and that 56% have thought about their childhood and parental relationships at least on a weekly basis.

Data were analysed categorically and numerically. Chi-square was calculated to investigate if there was any association between intergenerational influences and MFAT score. There were significant positive associations between the quality of the relationship with the woman's parents and experiences of childhood influencing adulthood ($\chi^2 = 21.61$, $df = 9$, $p = 0.01$); between the relationship with the woman's parents and reflections on childhood ($\chi^2 = 25.98$, $df = 9$, $p = 0.002$) and between experiences of childhood influencing adulthood and reflections on childhood ($\chi^2 = 38.77$, $df = 9$, $p = 0.0001$). There were no significant associations between the qualities of the relationship with the woman's parents; experiences of childhood influencing adulthood; reflections on childhood / parenting experiences and MFAT score. This suggests that although childhood does influence thoughts

on parenting it does not appear to influence attachment. It should be noted that all calculations resulted in cells having an expected count of less than 5. Norusis (2003) identified that for an accurate calculation cells should have expected values greater than 5, however the minimum expected value is 1, this is achieved.

Pearson's correlation coefficient was used to assess any relationships between intergenerational attachment and attachment score and relationships between experiences of being parented and behaviours / emotions in pregnancy. There are several relationships within the correlations on influence of intergenerational factors on attachment. It would appear that there is a positive relationship between *the woman's experiences of childhood influencing adult life* and *how often the woman reflects on childhood and parenting* ($r = 0.15$, $df = 198$, $p = 0.0001$). There is a positive relationship between *the quality of the woman's relationship with her parents* and *the influence of childhood experiences on adult life* ($r = 0.14$, $df = 198$, $p = < 0.04$). There is also a positive relationship between *the quality of the woman's relationship with her parents* and *the score on the MFAT* ($r = 0.15$, $df = 198$, $p = < 0.03$). The r values calculated demonstrate a weak linear relationship. However Norusis (2003) states that correlations are not always linear; indeed there are many different shapes /types which also demonstrate an association between the variables. This result provides some evidence to

support the hypothesis that positive quality relationships between parents and their children facilitate the development of maternal-fetal attachment.

6. The main emotion experienced by the women towards her developing baby is protection. This protective emotion causes behavioural change to ensure the fetus has a favourable intra-uterine environment.

Questions 5 (*Would you describe your main feeling towards the baby as protective?*) and question 7 (*Do you believe that your baby is dependent upon you?*) specifically relate to the women's main emotion being that of protection. Figure 17 show that the majority of women stated that their main feeling towards the fetus was protection. This need to protect is compounded by the women's belief that the fetus is dependent upon them, with 88% stating their baby was dependent upon them and the remaining 12% stating that they believed the fetus was dependent upon them to some extent (question7). This appears to have caused behavioural changes with 75% of participants changing their diet in response to the pregnancy (question 17). This supports the notion that the main reported emotion during pregnancy is protection and this provides the incentive to make changes to ensure the safety and survival of the fetus.

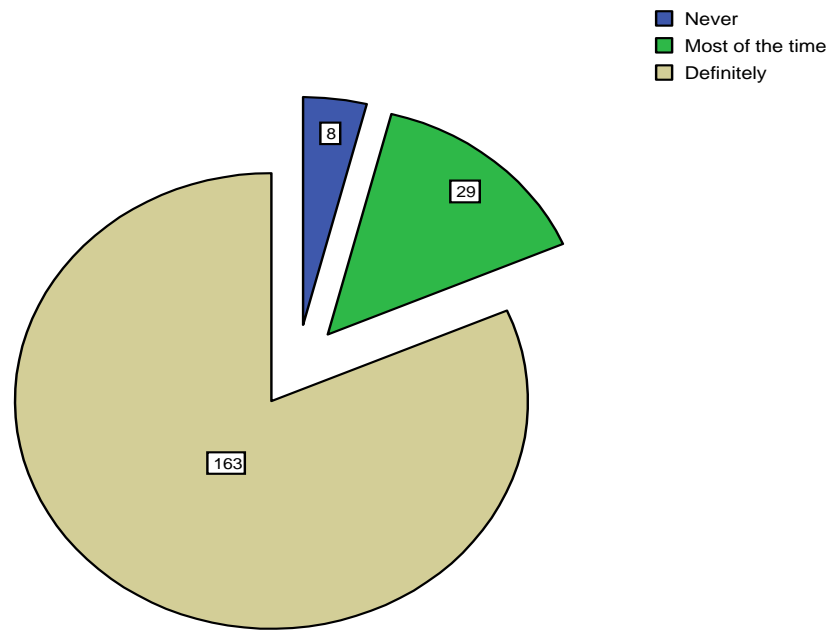


Figure 17: Responses to question 5 - Would you describe your main feeling towards the baby as protective? (n = 200).

Chi-square was calculated on the responses to questions 5 and 17 to investigate whether there are any association between emotional and behavioural attachment. A significant positive association was found between the women's emotional and behavioural statements of protection ($\chi^2 = 13.8$, $df = 6$, $p = 0.03$). This is supported by the result of Pearson's correlation which found a moderately positive relationships between emotional protection and the MFAT score ($r = 0.52$, $df = 198$, $p = < 0.0001$).

In summary the findings from the responses to the Maternal-Fetal Attachment Tool (MFAT) support the definition that underpins the questionnaire. Parity (already having children) affects attachment to the developing fetus; a one-way analysis of variance showed that parity affects the MFAT score, with the mean MFAT score for primigravid women being significantly greater than for multiparous women. The continued support of a partner has a positive effect on maternal-fetal attachment. Scheffe's range test found that the MFAT score for married women differed significantly from single women and from those women in co-habiting relationships. It was also found that the MFAT score for co-habiting women was significantly different than that of single women; with married women scoring higher than any other category. Marital relationships appear to positively promote attachment. Maternal-fetal attachment is developmental in nature, getting stronger with the ever evolving signs of the tangibility of the pregnancy. A one-way unrelated ANOVA showed that overall gestation has a significant effect on maternal-fetal attachment score; however attachment appeared to plateau in the third trimester. There is evidence that a woman's positive experiences of being parented have a positive relationship on her attachment to her fetus. Pearson's correlation coefficient showed moderately positive relationships between emotional protection and the MFAT score and between protective behaviours towards the fetus and MFAT score.

The results of internal reliability testing, together with experiences gained whilst administering the Maternal-Fetal Assessment Tool demonstrated the need to modify the MFAT to increase reliability.

10.3: Further Development and Testing of the Tool

Modification of the Tool

Following analyses of the 200 questionnaires collected to test for reliability, it was evident that the questionnaire needed modification.

- Cronbach's alpha had shown for the generic questions and the questions for multiparous women on the MFAT questionnaire that there was only a weak item-total reliability. This needed improving to produce a reliable tool.
- Items 14 and 18 did not appear to be either adequately testing attachment or giving accurate results.
- Instructions for completing the questionnaire to be more clear and prominent. The instructions were logical and clearly identified in a progressive bullet pointed format. The instructions were framed in a bold box to make them easily seen.

- The biographical data needed to be presented in a more user-friendly and professional format. Questions needed to be set out clearly in bold type with an identifiable line for answers. There needed to be choices for ethnic origin; some participants clearly did not understand the usual classification system and gave some invalid answers. For analysis it was thought it would be useful not only to identify parity, which was found to be important to developing attachment, but also to collect data on how many pregnancies the woman had experienced to explore whether this had a significant effect on attachment.

Following exploration of the data and deliberation on the results of analyses it was decided to delete items 14, 18, 19 and 22. For items 14 and 18 this was for three reasons - these items if deleted had a reasonably high probability of improving the alpha reliability, plus factor analyses demonstrated these items did not load on any of the six factors which identified attachment and there was a desire to have as concise a questionnaire as possible to improve user-friendliness.

Item 14 asked *"Is the sex of the baby important to you?"* This item had been included because during the qualitative phase of data collection, this had been important to some women, particularly multiparous women and to some men. However, very few of the 200 women sampled stated that the sex of

their baby was important. Therefore the motivation for the inclusion of this question appeared unfounded and did not add to the body of knowledge. If this item was deleted the Cronbach's Alpha would be: for multiparous women (110) 0.66; for primigravid women (90) 0.70 and for all participants (200) 0.66.

Item 18 *"When were you happy that the pregnancy was safe and would develop into a healthy baby"* was difficult to score. It often reflected previous poor pregnancy outcomes than the woman's feelings towards her fetus. It was useful to be at the antenatal clinic whilst the questionnaires were completed as the women often discussed / rationalised the answers they had given, some women made notes on the questionnaire rationalising their responses. Many women were aware that birth can still be dangerous. Babies do not all survive their birth and despite how much the women were attached to their fetus they still feared the birth process. This pessimistic view of birth did not affect their feelings towards their fetus. Indeed it appeared that some women who were attaining high maternal-fetal attachment scores scored poorly on this item. If this item was deleted the cronbach's Alpha was for multiparous women 0.68; for primigravid women 0.70 and for all participants 0.67. This item was therefore considered flawed. Item 4 questioned when the women first perceive the pregnancy as a baby; this

provided a more easily understood and assessable response to the development of attachment.

Item 22 for multiparous women "*Would you say that already having a family has influenced decisions and your experience of pregnancy*" was not contributing to the attachment score. It was to an extent a statement of fact that the majority of women identified within the qualitative phase of the research. It was unavoidable that family commitments to existing children had to be considered when making any decisions within pregnancy and that inevitably as all new experiences are measured against previous encounters, the present pregnancy would be measured against the woman's previous experience. This item was therefore consistently being answered in a negative manner and not reflecting the true feelings of the women towards their fetus. The answer suggested that the women were not attaching as effectively as they had during their first pregnancy, when in fact they were responding to the current pressures of parenting. It was also the least reliable of all items with the highest alpha score if deleted (Cronbach's Alpha if deleted 0.69).

In order to balance the questionnaire it was necessary to also delete an item for primigravid women, both questions appeared to be measuring attachment. It was decided to make the decision based on the statistical results alone. Item 19 "*Is pregnancy as exciting as you had expected*" had a

slightly higher alpha score if deleted (0.69) and a lower score on factor analysis and was therefore deleted.

A further Cronbach's coefficient alpha was performed on the revised questionnaire to determine if internal reliability had been improved. The results demonstrated that the sixteen generic items achieved an improved alpha of 0.69; the seventeen items answered by primiparous women achieved an alpha of 0.72 and the seventeen items specific to multiparous women achieved an alpha of 0.72. It was decided to use this revised tool for the next round of data collection (Appendix Nine: Final Questionnaire)

10.4: Testing the Modified Tool for Reliability: Cohort 2

Internal reliability

Within this round data were collected from 150 women (61 primigravid women and 89 multiparous women) all within their final trimester of pregnancy. As in round one this test has been applied to the generic 16 items, those 17 items answered specifically by primigravid women and those 17 items answered by multiparous women.

1. Cronbach's Alpha coefficient:

- a. The alpha reliability of the 16 generic item scale completed by all participants was 0.75
- b. The alpha reliability for the 17 item scale completed by multiparous women was 0.73
- c. The alpha for the 17 item scale completed by primigravid women was 0.81

All these alpha scores are above the 0.7 level, therefore the revised MFAT has demonstrated that it is a reliable tool that consistently measures for both primigravid and multiparous women maternal-fetal attachment (Appendix Twelve).

2. Factor Analysis

A principle axis factor analysis was conducted on the correlations of the 16 generic items within the Maternal-Fetal Attachment Tool (MFAT). Six factors were extracted with Eigen values equal or greater than 1.00, shown in Figure 18 Cattell's Scree Slope below. Orthogonal rotation of factors yielded the factor structure given in Table 29. Factor 1 accounted for 8.04% of variance; Factor 2 for 7.43%; Factor 3 for 6.59%; Factor 4 for 4.99%; Factor 5 for 4.49% and Factor 6 4.02% - cumulative total 35.57%. These factors appear to reflect the 6 themes identified from the qualitative phase of the research - factor 1 seems to be physical and emotional adaptation to

pregnancy; factor 2 protection; factor 3 intimacy of pregnancy; factor 4 tentative pregnancy; factor 5 the developmental nature of pregnancy and factor 6 social support (Appendix Twelve).

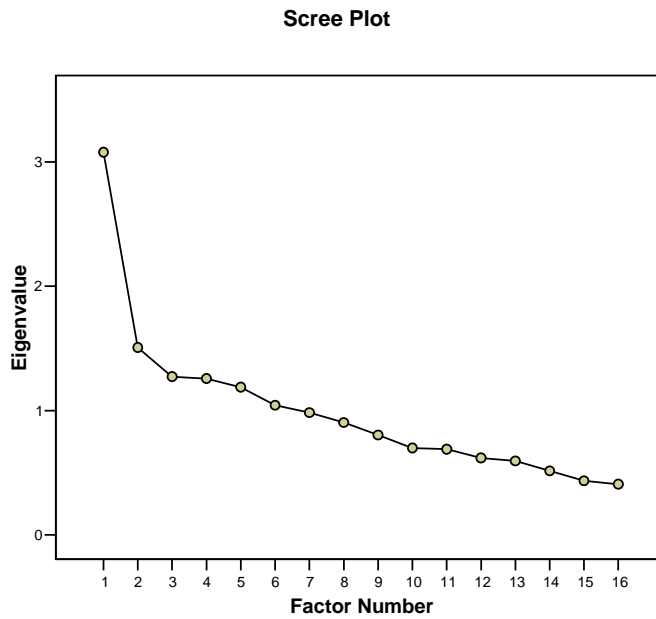


Figure 18; Cattell's Scree Plot

Table 28: Orthogonal factor loading matrix for the 16 generic items.

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor6
1	0.666	-0.035	0.103	0.047	-0.095	-0.020
6	0.554	0.296	-0.052	-0.037	-0.014	0.154
3	0.461	0.143	0.254	0.285	-0.005	0.160
15	0.266	0.010	-0.095	0.177	0.084	0.077
5	0.232	0.586	0.106	0.277	-0.029	0.015
11	0.099	0.567	0.043	0.090	0.242	0.108
13	0.108	0.467	0.441	0.119	-0.014	-0.068
4	0.263	0.266	0.045	0.071	0.240	-0.226
2	-0.061	0.180	0.120	-0.043	0.009	0.084
12	0.052	0.134	0.819	0.045	0.061	-0.013
8	0.116	0.100	0.062	0.532	0.251	-0.239
16	0.065	0.066	0.007	0.486	-0.134	0.148
7	-0.002	0.081	0.168	0.207	0.162	0.138
9	-0.060	0.074	0.030	0.003	0.658	0.075
10	0.148	0.077	-0.021	0.105	0.062	0.574
14	0.239	0.210	0.202	-0.050	0.192	0.282

Although item to factor loading appears different for this cohort, the percentage of variance is very close and therefore simply represents a difference of experience / opinion, whilst supporting the six themes. It has again been shown that many items load on more than one factor showing the multifactorial and interdependent nature of maternal-fetal attachment.

10.5: Testing the Modified Tool for Validity: Cohort 2

Criterion Validity

Concurrent validity and convergence:

150 women within their third trimester of pregnancy were simultaneously administered and completed the new tool (MFAT) and Condon's (1993) tool (MFAS).

Concurrent validity and convergence was demonstrated. There was a significant positive relationship between the MFAT and MFAS results ($r = 0.68$, $df = 148$, $p = 0.001$). This demonstrates that the MFAT is a valid assessment tool and can be used to measure maternal-fetal attachment.

Construct Validity

The new tool (MFAT) and Condon's (1993) MFAS were concurrently completed by 150 women within their final trimester of pregnancy.

Homogeneity:

Cronbach's alpha coefficient was used to analyse the consistency of the items in measurement of a single concept, correlating Condon's MFAS to the new tool (MFAT). The alpha reliability when comparing the 35 items scale of the MFAT to MFAS questionnaire was 0.89, indicating a good internal consistency. The MFAT questionnaire is consistently measuring maternal-fetal attachment.

In summary following modification of the Maternal-Fetal Attachment Tool (MFAT) it was administered to 150 pregnant women in the final trimester of pregnancy. Internal reliability was improved to an acceptable level, demonstrating that the tool was consistently a reliable instrument. Factor analysis remained similar with six factors extracted accounting for 35.6% of the variance. The new tool was tested for validity by simultaneously administering the new MFAT and Condon's (1993) Maternal-Fetal Attachment Score questionnaire to the same sample of 150 pregnant women in the final trimester of pregnancy. Concurrent validity was statistically demonstrated with Pearson's correlation coefficient showing a significantly positive relationship between the two tools. Construct validity was established with homogeneity or internal consistency achieving a good alpha reliability and Pearson's correlation coefficient test for convergence confirming a significant

positive correlation between the tools. Analyses of this data confirmed that the Maternal Fetal Attachment Tool is both reliable and valid.

10.6: Testing the definition of maternal-fetal attachment: Cohort 2

Within the cohort 24% were found to be poorly attached, 53% attached and 23% highly attached. To provide an overview of the results differing groups of pregnant women within the cohort scored in the Maternal-Fetal Attachment Tool descriptive statistics were used, to show mean, standard deviation, minimum and maximum scores (Table 29, below).

Analyses of the data identified the factors that had no effect upon maternal-fetal attachment. One-way ANOVAs demonstrated no significant effect on the maternal-fetal assessment score for ethnic origin ($F_{7,142} = 2.017, p = > 0.05$); social group ($F_{10,139} = 1.776, p = > 0.05$); age ($F_{3,146} = 0.764, p = > 0.05$) or age completed full-time education ($F_{2,147} = 0.124, p = 0. > 0.05$). An independent sample t -test showed that graduate status also had no significant effect on MFAT score ($t = 1.29, df = 148, \text{two-tailed } p = > 0.05$).

Table 29: Descriptive statistics of the results of MFAT scores (n = 150).

Participants	Number	Mean	Std. Deviation	Minimum Score	Maximum Score
Whole Cohort	150				
Parity	150				
Primigravida	61	40.57	5.44	20	49
Multiparous	89	37.73	4.98	16	46
Gestation	150				
27 -30 weeks	40	37.95	5.93	16	47
31 - 34 weeks	56	39.18	4.53	30	48
35 - 38 weeks	46	39.5	5.72	25	48
39 - 41 weeks	8	38.88	5.74	31	49
Marital Status	149				
Single	14	36.71	6.78	20	48
Married	87	39.76	4.55	30	49
Co-habiting	48	37.85	5.97	16	48
Age (Years old)	150				
15 - 19	11	37.45	7.69	20	48
20 - 29	66	38.53	5.87	16	47
30 - 39	71	39.35	4.34	28	49
40 plus	2	42.00	5.66	38	46
Age completed FTEd	150				
16	70	39.1	5.99	25	46
18	57	38.87	6.03	16	47
21	23	39.57	3.94	31	46
Graduate Status	150				
Yes	36	39.89	4.20	30	47
No	114	38.82	6.11	16	46
Standard Occupation Classification (2000)	150				
1	9	39.22	3.99	32	44
2	16	39.69	3.95	33	46
3	21	40.71	4.09	31	47
4	22	39.95	5.60	25	49
5	0				
6	22	40.91	6.93	28	46
7	13	39.08	4.66	30	44
8	4	42.00	6.22	33	47
9	6	39.00	3.16	35	44
Student	5	35.40	9.41	20	45
Unemployed	7	35.43	6.02	31	48
Housewife	25	36.20	6.28	16	46
Ethnic Origin	150				
White British	118	39.58	5.52	16	46
White Irish	4	39.00	4.97	33	44
White European	11	36.00	3.72	30	41
Black British	7	34.71	8.28	20	43
Black Caribbean	1	48.00			
Pakistani	7	40.29	6.29	31	46
Indian	1	35.00			
Turkish	1	31.00			

1. Parity and marital status appear to affect maternal-fetal attachment

The 150 participants were compared to explore the effects that parity and marital status had on attachment scores. A two-way unrelated ANOVA showed that both parity and marital status significantly explain the variance within the maternal-fetal attachment score (Table 30 below).

Table 30: Analysis of variance summary table showing the effect of parity and marital status on MFAT score (n = 150)

Source of variation	Sum of Squares	df	Mean Square	F	Sig.
Parity	125.08	1	125.08	4.14	.04
Marital Status	231.36	2	115.68	3.83	.02
Parity with Marital Status	10.60	2	5.30	0.17	.839
Error	4322.92	143	30.23		

There was a significant positive effect of parity on the attachment score ($F_{1, 143} = 4.14, p = < 0.04$), primigravid women scoring higher; and marital status had a significant positive effect on the maternal-fetal attachment score ($F_{3, 143} = 3.83, p = < 0.02$), married women scoring higher. There was no interaction between parity and marital status upon the maternal-fetal attachment score ($F_{2, 143} = 0.17, p = > 0.05$), which suggests that these factors act independently upon the dependent variable.

2. The women's emotional attachment to the developing fetus is affected by the presence of siblings.

Using an unrelated t-test the mean MFAT scores for primigravid and multiparous women were compared; it was found that the mean score of primigravid women ($M = 40.57$, $SD = 5.44$) is significantly higher ($t = 2.71$, $df = 148$, two-tailed $p = < 0.01$) than that of multiparous women ($M = 38.06$, $SD = 5.70$). Primigravid women appear to have a greater attachment to their fetuses than multiparous women.

The parous women were divided into groups according to how many viable children they had born (gravida 2, gravida 3, gravida 4 plus) to discover if greater parity affects Maternal-Fetal Attachment Tool (MFAT) score. A one-way unrelated ANOVA showed that the number of viable children born had no significant effect on maternal-fetal attachment score ($F_{2, 83} = 0.18$, $P = 0.8$), Table 31 below.

Table 31: Analysis of variance summary table showing the effect of increasing parity on MFAT score (n = 150).

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	12.27	2	6.14	0.18	.83
Within Groups	2785.31	83	33.56		
Total	2797.58	85			

3. The continued social support of a partner type relationship has a positive effect on maternal-fetal attachment.

A one-way analysis of variance showed marital status had a significant effect on the MFAT score ($F = 2,146 = 3.80$, $p = < 0.05$), Table 32 below. There were no separated or divorced women within the cohort.

Table 32: Analysis of variance summary table showing the effect of marital status on MFAT score ($n = 150$).

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	239.47	2	119.74	3.80	.02
Within Groups	4606.10	146	31.55		
Total	4606.10	148			

Scheffe's multi-comparison test showed that although there was no significant difference ($p = > 0.02$) between the MFAT score for single and cohabiting women ($M = 36.71$ & 37.85); there was a significant difference ($p = < 0.02$) for married women ($M = 40.09$). Married women score higher than both women in co-habiting relationships and single women. It would appear that formalised, marital relationships are more beneficial to promoting maternal-fetal attachment than simply "living together".

4. Maternal-fetal attachment is developmental in nature.

The responses to question 4 on the MFAT questionnaire, which asks *when did you first think of the pregnancy as a real baby* supports the notion that maternal-fetal attachment is developmental. Figure 19 shows that by the time the woman recognise strong fetal movement within the second trimester of pregnancy 94.7% of participants thought of the pregnancy as "a real little person". Discovery of pregnancy, ultra-sound scan and recognition of fetal movements occur chronologically within the first and second trimester, suggesting that although developmental in nature most women are attached by the third trimester of pregnancy. It is hypothesised that attachment does not significantly increase within the final trimester of pregnancy.

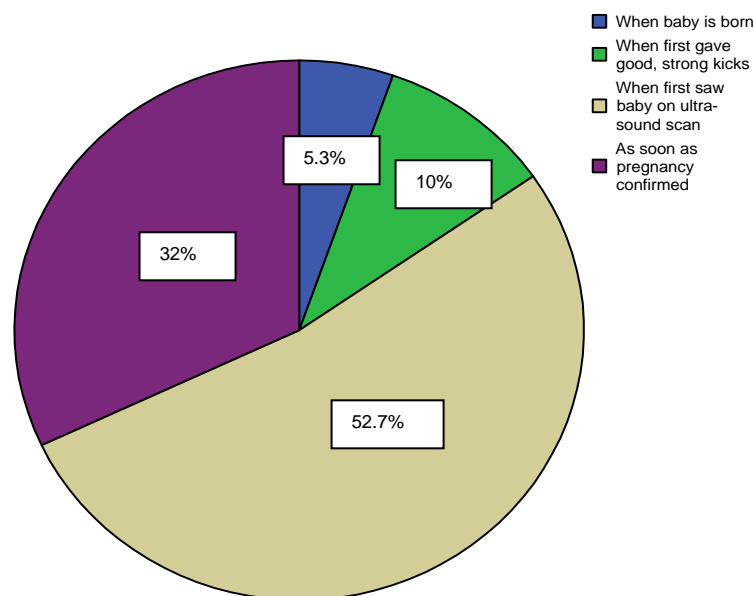


Figure 19: Responses to question 4 - When did you first think of the pregnancy as a baby - a real little person? (n = 150)

To test the effect of gestation on the Maternal-Fetal Attachment Tool (MFAT) score the 150 participants were divided into 4 groups for comparison: 27 -30 weeks pregnant; 31 - 34 weeks pregnant; 35 - 38 weeks pregnant and 39 - 41 weeks pregnant, all participants were within their final (third) trimester of pregnancy. A one-way unrelated ANOVA showed that overall gestation had no significant effect on maternal-fetal attachment score ($F_{3, 146} = 0.57, p = < 0.5$), Table 33 below.

Table 33: Analysis of variance summary table showing the effect of gestation, within the third trimester on MFAT score (n = 150).

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	49.65	3	16.55	.57	.632
Within Groups	4201.42	146	28.77		
Total	4251.07	149			

This supports the findings from Round One, which established that whilst maternal-fetal attachment progressively develops during the first and second trimester it does not increase significantly within the final trimester of pregnancy remaining similar until the birth.

4. The quality of the woman's relationship with her parents has a positive relationship with maternal-fetal attachment

The responses given to the questions (9 - 11) on intergenerational

attachment that was additional and supernumerary to the Maternal-Fetal Attachment Tool provided the following results:

a. *How would you describe your relationship with your parents?*

Distant 2%; Tolerated 8.7%; Close 26.6%; Very Close 62.7%

b. *How much do you believe that your experiences in childhood have influenced you as an adult?*

Not at all 4%; Somewhat 10%; Significantly 46.7%; Greatly 39.3%

• *How often in the last month have you thought about your own childhood and your relationship with your parents?*

Never 15.3%; Occasionally 31.3%; Weekly 41.3%; Daily 12%

These results indicate that the majority of the participants has a close relationship with their parents (89.4%), with the majority of this cohort (62.7%) reporting a "very close" relationship; that there was a widely held belief that childhood experiences influence life as an adult (86%) and that 53% have thought about their childhood and parental relationships at least on a weekly basis.

Data were analysed categorically and numerically. Chi-square was calculated to investigate if there was any association between intergenerational influences and MFAT score. There were significant positive associations between the quality of the relationship with the woman's parents

and experiences of childhood influencing adulthood ($\chi^2 = 30.49$, $df = 9$, $p = 0.0001$); between the relationship with the woman's parents and reflections on childhood ($\chi^2 = 24.79$, $df = 9$, $p = 0.003$) and between experiences of childhood influencing adulthood and reflections on childhood ($\chi^2 = 25.13$, $df = 9$, $p = 0.003$). There were no significant associations between the qualities of the relationship with the woman's parents; experiences of childhood influencing adulthood; reflections on childhood / parenting experiences and MFAT score. This suggests that although childhood does influence thoughts on parenting it does not appear to influence attachment. It should be noted that all calculations resulted in cells having an expected count of less than 5.

Pearson's correlation coefficient was used to explore the relationships between the data on inter-generational relationships and MFAT score. It would appear that there was a positive relationship between *the woman's experiences of childhood influencing adult life* and *how often the woman reflects on childhood and parenting* ($r = 0.27$, $df = 198$, $p = 0.0001$). There was a positive relationship between *how often the women reflected on childhood / parenting and the quality of their relationship with their parents* ($r = 0.17$, $df = 148$, $p = < 0.05$). There was also a positive relationship between *the quality of the woman's relationship with her parents* and *the score on the MFAT* ($r = 0.23$, $df = 148$, $p = < 0.01$). The r values calculated demonstrate a weak linear relationship. This provides some evidence to support the hypothesis that

positive quality relationships between parents and their children facilitate the development of maternal-fetal attachment.

5. The main emotion experienced by the women towards her developing baby is protection. This protective emotion causes behavioural change to ensure the fetus has a favourable intra-uterine environment.

Questions 5 (*Would you describe your main feeling towards the baby as protective?*) and question 7 (*Do you believe that your baby is dependent upon you?*) specifically relate to the women's main emotion being that of protection. Figure 20 presents the results from question 5; this shows that the majority of the women stated that their main feeling towards their fetus was protection. The need to protect is compounded by the women's belief that their fetus is dependent upon them; 98.6% stated in their answer to question 7 that their fetus was dependent. These findings appear to be reflected in positive behavioural changes with 88% giving a positive response to question 16, *"Has pregnancy caused you to make changes to your diet?"*. This supports the notion that the main emotion during pregnancy is protection and this provides the incentive to make changes to ensure the safety and survival of the fetus.

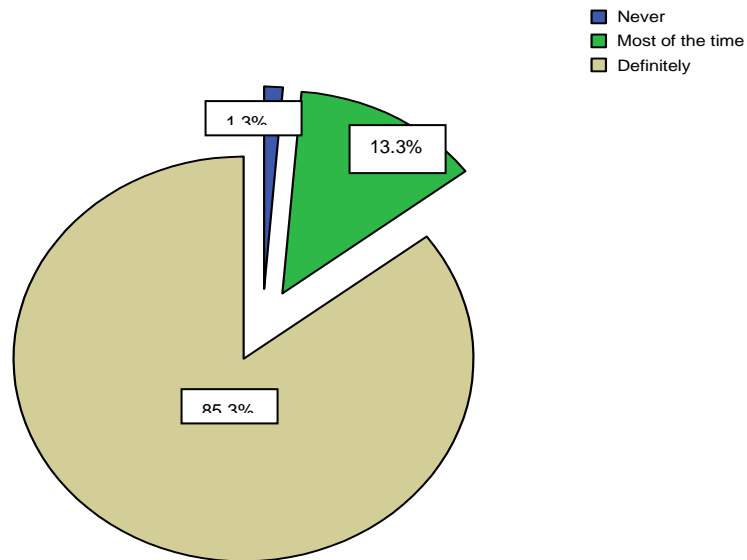


Figure 20: Responses to question 5 - Would you describe your main feeling towards the baby as protective? (n = 150)

Chi-square was calculated on the responses to questions 5 and 16 to assess if there is any association between emotional and behavioural attachment. Within this cohort there was no significant association between the women's emotional and behavioural statements of protection ($\chi^2 = 3.69$, $df = 6$, $p = 0.72$). However question 5 has a moderately significant positive relationship with the Maternal-Fetal Attachment Tool (MFAT) score ($r = 0.47$, $df = 148$, $p = < 0.0001$).

In summary the findings from the responses by participants within Round 2 to the Maternal-Fetal Attachment Tool (MFAT) supports the definition that underpins the questionnaire. Pre-existing siblings affect

attachment to the developing fetus. A one-way analysis of variance demonstrated that there was a significant effect of the independent variable parity on the dependent variable MFAT score; with an unrelated t-test showing that the mean score of primigravid women was significantly higher than that of multiparous women. The continued support of a partner had a positive effect on maternal-fetal attachment. Scheffe's multi-comparison test found that although there was no significant difference between the MFAT score for single and cohabiting women, the score was a significantly higher for married women. A marital relationship would appear to enhance the woman's attachment. Maternal-fetal attachment is developmental in nature. However, as demonstrated by Cohort 1 attachment appears to remain stable within the final trimester of pregnancy. This is reinforced by the findings of a one-way unrelated ANOVA which showed that overall gestation had no significant effect on maternal-fetal attachment score within Cohort 2 in their final trimester of pregnancy. Attachment therefore appears to develop in the first and second trimesters, reaching a plateau in the final trimester in readiness for physically becoming acquainted with their baby. There is some evidence to suggest that the quality of the relationship with parents positively affects the MFAT score.

Summary

The Maternal-Fetal Attachment Tool was tested for reliability and validity. The initial questionnaire was tested on 200 women within the second and third trimesters of pregnancy. Internal reliability tested by split half reliability and Cronbach's Coefficient Alpha showed that the items answered by primigravid women achieved an acceptable level of reliability, but the generic items and those answered by multiparous women showed only weak reliability. Before testing for validity the items were further analysed using Cronbach's alpha coefficient and items deleted to improve item - total reliability.

External reliability was established by administering the Maternal-Fetal Attachment Tool (MFAT) to 100 pregnant women on 2 occasions at least 2 weeks apart. Pearson's correlation coefficient showed a positive correlation between the results time 1 and time 2. External reliability was confirmed with the Proportion / Percentage of Agreement Test.

The MFAT was revised following the first round of testing. The revised questionnaire was tested on 150 women within the final trimester of pregnancy for internal reliability and validity. A good level of internal reliability was achieved for the generic items, the items answered by primigravid women and those answered by multiparous women. Concurrent validity was demonstrated with Pearson's correlation coefficient showing a

significant positive relationship between the Maternal-Fetal Attachment Tool and Condon's (1993) Maternal Antenatal Attachment Scale. Internal consistency and convergence (construct validity) was shown to be evident, the results of collected data showing a very good alpha reliability and positive correlation between tools. These results establish that the Maternal-Fetal Attachment Tool is both reliable and valid.

Through analysing the data further the definition has been further explored. Factor analysis has identified the multi-dimensional and interdependent nature of maternal-fetal attachment. The results of the data collected from in total 350 pregnant women within the second and third trimesters of pregnancy shows that maternal-fetal attachment is developmental in nature. Socio-economic group, age, education and graduate status do not affect the maternal-fetal attachment score. Social support from a partner appears fundamental, with a positive effect on the pregnant woman's attachment score. Parity affects maternal-fetal attachment, with primigravid women scoring consistently higher on MFAT. There is also some limited evidence that inter-generational attachment facilitates the development of attachment. The fundamental emotion expressed by the women is one of protection towards their fetus.

Chapter Eleven

Discussion

Attachment theory has evolved over many decades, with the definition developing to reflect the emerging body of empirical evidence. As maternal-fetal attachment is a relatively new concept within the theory, the definition is within its embryonic stage; with Goulet *et al.* (1998) identifying that there is no universal definition. The work reported here has generated through qualitative methodology a definition of maternal-fetal attachment, which has been further tested through quantitative means. This definition created from the pregnant women's own standpoint, has been utilised as a framework on which to formulate a Maternal-Fetal Attachment Tool to effectively measure this concept.

A reliable and user-friendly tool to measure maternal-fetal attachment has been generated, developed and validated. The Maternal-Fetal Attachment Tool (MFAT) developed in this study has been more rigorously tested for internal and external consistency, face and content validity, concurrent validity, internal consistency, convergent validity and factor analysis. Both cohorts were sufficient samples of women within their second and third trimesters of pregnancy, with final testing of the MFAT completed

on a homogenous sample of women within their final trimester of pregnancy. Existing commonly used maternal-fetal attachment instruments have not been thoroughly tested for reliability and validity. Criticism can be levelled for a variety of problems ranging from lack of reliability to limited generalizability due to the sample (Chapter 4). The first to be produced and the least robustly tested tool was Cranley's (1981), a small sample of 71 participants, 35-40 weeks gestation took part in validating the instrument. The tool was tested for internal reliability, face and content validity, predictive validity and internal consistency; with good results for internal reliability. This was the first tool to be available to facilitate research into maternal-fetal attachment. However, repeated use in many studies has identified that the tool sometimes generates inconsistent and conflicting results (Muller, 1992; Zachariah, 1994). However the tool is easy to use, with good internal reliability and Muller (1992) suggests that it can be used effectively in conjunction with another tool that measures emotional attachment.

Condon's (1993) Maternal Antenatal Attachment Scale (MAAS) instrument was tested on 112 women 15 - 38 weeks gestation for internal reliability, face validity, internal consistency and factor analysis, with good internal reliability. Testing on women at such a wide range of weeks gestation is problematic. The findings from numerous empirical studies including this study and studies by Siddiqui *et al.* (1999), Sjogren *et al.* (2004) and Della

Vedova *et al.* (2008) have found attachment to develop as the pregnancy progresses. Indeed it has been shown within this study that attachment develops in the first two trimesters and stabilises within the final trimester. This is supported by Kemp and Page (1987) and Siddiqui *et al.*, (1999) who found that attachment mirrors the woman's emotional state which changes during the course of pregnancy, stabilising within the final trimester of pregnancy when she has adapted to the substantial physiological changes of pregnancy. Condon's results therefore sampled from gestations ranging from 15 - 38 weeks would not be consistent and would confound. The MAAS has been criticised by Zimerman & Doan (2003) for the validity of the 2 subscales which can further confound results, particularly in multiparous women. The MFAT is a shorter questionnaire of 19 items and therefore more user-friendly.

Muller's (1993) Prenatal Attachment Inventory (PAI) was validated using a robust sample of 310 women 14 - 41 weeks pregnant, internal reliability, content validity, concurrent validity, internal consistency and factor analysis were all performed. Generally evaluated as a robust tool (Gau & Lee, 2003), it has been criticised for Muller's one-dimensional interpretation of factor analysis. Siddiqui *et al.* (1999) found whilst using a modified PAI that a 5 factor structure emerged from their data. Empirical studies by Bielawska-Batorowicz and Siddiqui (2008) and Della Vedova *et al.*

(2008) also found a five factor structure, similar to those found by Siddiqui *et al.* (1999), when using Muller's PAI to measure maternal-fetal attachment. In this study factor analysis has identified a six factor solution, reflecting the themes found from analyses of the qualitative data and supporting not only the multi-dimensional nature of maternal-fetal but that the factors are interwoven / interdependent.

The major criticism of earlier tools is the lack of a comprehensive definition of maternal-fetal attachment, insufficient to form an underpinning framework for understanding and interpreting any results obtained (Muller, 1992; Condon, 1993; Condon & Corkindale, 1997). Some earlier tools have simply used literature searches as a basis for formulating a definition and generating items within the questionnaire. Others are criticised for a lack of methodological rigour, having used a combination of literature and informal discussions with pregnant women or health professionals as a basis for item generation. Within the reported study the qualitative standpoint has been taken in order to produce a realistic and working definition of maternal-fetal attachment. To discover what maternal-fetal attachment means, it was imperative to ask the people that were experiencing the phenomenon - pregnant women. This methodology is supported by Muller (1993) who stated that the most appropriate framework to underpin a measuring tool for

maternal-fetal attachment would be one that has been created from the pregnant women's own perspective and experience.

The women, following analysis of the rich data collected during interviews and focus groups, described maternal-fetal attachment as a complex multidimensional relationship; an innate affectionate emotion which overwhelmingly stimulates the need to protect and safeguard the fetus. This sense of the need to protect instigated behavioural changes to ensure a favourable intra-uterine environment to promote fetal growth and eliminate threats to fetal well-being. The attachment relationship was progressive and to some extent exclusive, inspired by tangible signs of viability, as the fetus grows and becomes stronger. During early pregnancy the women are ambivalent as they balance their faith in the reality and security of their pregnancy with fears of possible loss and the debilitating early pregnancy symptoms. Essential within the development of maternal-fetal attachment was consistent social support. The woman psychologically and physically benefited from the loving support of a partner, parent or close friend. Within social support the women identified the importance of their parents and the need to revisit their own experiences of being parented. The optimum desired support was that of a compassionate partner. With women actively seeking sustained, positive partner support. They encouraged their

partners to vicariously participate and share in pregnancy prompting their partner's attachment and protective behaviours.

From this explanation of maternal-fetal attachment a definition to summarise the main points and provide a framework to underpin and facilitate interpretation of the questionnaire was produced:

Maternal-fetal attachment describes the intimate and developing affectionate relationship between the pregnant woman and her fetus. It is a natural and protective response that results in behavioural change to ensure fetal survival. This complex, multi-dimensional relationship is fundamentally affected by biological, social and psychological factors.

The six themes evident within the women's definition of antenatal attachment were used as a basis for the generation of items and the production of a questionnaire. Maternal-fetal attachment is unique, a gradual "getting to know" the developing life within. As evident from the women's definition and previous empirical findings, maternal-fetal attachment is multi-dimensional, growth of attachment is dependent on biological, social and personal factors that must be reflected within the questionnaire if, as suggested by Sjogren *et al.* (2004), a realistic assessment of a woman's level of attachment is to be assessed.

Following scrutiny for content and face validity the revised self-reported, person-based questionnaire of 22-items, each with 4 option-ranked responses, was tested for internal and external reliability. As a result the tool was modified (18-items / 4 responses) before finally testing for internal reliability, criterion-related and construct validity. Results demonstrated that the final questionnaire was both reliable and valid. Critical analysis of the three most commonly used existing maternal-fetal attachment tools showed that none had been tested as thoroughly for reliability and validity (Chapter 4).

11.1 Psycho-biological Theory as a Framework for Antenatal Attachment

The findings from both qualitative and quantitative data analyses has identified that the nature of pre-natal attachment is psycho-biological, with maternal-fetal attachment found to be inherently natural, developmental in nature and fundamentally influenced by social, cultural and personal factors. It has been found that maternal-fetal attachment is a natural response to protect the developing fetus promoted by societal expectations, individual experiences of attachment and adequate social support. This corroborates the premise first identified by Bowlby within his paper "The Nature of the Child's Ties to his Mother" (1958) that attachment has its origins within the psycho-biological paradigm. The psycho-biological paradigm is a theoretical

approach that acknowledges the multi-dimensional nature of human behaviour which defies definition within a single discipline and necessitates an integrated multidisciplinary approach. Eppel (2005) noted that the complementary links between psychology and biology, between genetics and environmental factors have led to a psycho-biological paradigm to explain behaviour.

Attachment results from the unmitigated dependence of the infant on its caregiver. The attachment behavioural system has evolved and remains entrenched within human nature as it increases the chances of survival throughout the vulnerable early years of life by instigating protective behaviours in wiser and stronger care-givers (Simpson, 1999). To ensure survival of the species, humans need the support of others. The concept of inclusive fitness explains how humans have adapted to group living to ensure survival of their offspring into adulthood to ensure reproductive success (Simpson, 1999). Cooperative group living necessitates socialisation with the need for emotional and social adaptation; the need for collaboration and compliance to the group norm. Rolls (1999) adds that to enhance effective group living humans have two higher level abilities - the ability to be altruistic and the ability to use language to rationalise and promote socially defined norms.

Bowlby (1969) proposed that the basis to behaviour is controlled by flexible and responsive behaviour systems that are innate but capable of appropriate reactions to environmental change, ensuring continued survival. The attachment behavioural system allows the individual to develop and respond flexibly to internal and external cues to ensure protection and survival of offspring. This behaviour system is supported by an internal working model that provokes the gradual development of an individualised attachment model which responds to sensitive, responsive parenting and experiences of attachment gained through a lifetime of interaction, demonstrating the importance of intergenerational attachment. Thus attachment as well as being a "genetically wired" system is affected by personal experiences of attachment and the social and cultural norms to which the individual is exposed.

The attachment relationship develops during pregnancy. Maternal consciousness of the fetus is critical to the development of attachment (Della Vedova *et al.* (2008) and is related to the woman's ability to form cognitive pictures of her fetus. (Righetti *et al.*, 2005). This develops through her own bodily sensations of the viability of the fetus and through technical advances that allow early visualisation of the fetus and intimate knowledge of fetus's physical and sensory development. This contributes to the woman's ability to develop a picture of her fetus, stimulates her interactions with the fetus and

provokes attachment behaviours. Bielawska-Batorowicz and Siddiqui (2008) found in their study that prenatal attachment behaviours demonstrate a commitment to the fetus through changing or adjusting behaviours to ensure the fetus has a favourable intra-uterine environment to facilitate healthy growth and development.

Within this study the principal emotion the women expressed for their fetus was protection. Protection is an instinctive behaviour to safeguard a precious or vulnerable entity from threat. For the pregnant women it was the need to ensure that their progeny was allowed to develop to continue their genetic line and survive to become a healthy baby. From the qualitative data it was found that from the beginning of pregnancy, even when the women felt impoverished due to the debilitating physical consequences of early pregnancy the women expressed the need to protect and preserve their pregnancy. Their biggest fear was miscarriage and reproductive failure. As a result of the need to protect the women changed their behaviour in order to ensure the pregnancy was not threatened by known teratogenic agents or inappropriate activity. Women actively sought advice from health professionals or respected parents to ensure they did not compromise the development of their fetus. Acting upon the advice women changed their diet, cutting out foods that may potentially harm the baby; stopped drinking alcohol and altered exercise regimes.

Women whose pregnancy was threatened by potential pressures to terminate became overtly protective towards the fetus. Similar protective feelings were evoked by screening for fetal anomaly which carries the potential to either terminate an affected fetus or the risk of miscarriage for the invasive screening tests; a primigravid interviewee said *"I decided not to have the tests ... I thought if we had the tests I would be worried ... I would not have considered termination"*, a multiparous participant stated *"I didn't really want an amnio ... because that can cause miscarriage"*. Women appear within these cases to put the life of their fetus above all else and seek to protect and defend the life they perceive as their exclusive responsibility.

Results from both rounds of quantitative data collection (Cohorts 1 and 2) confirm the earlier qualitative findings; the majority stating they felt protective towards their fetus and both cohorts acknowledging that the fetus either totally depended upon them or depended upon them to some extent. The dependency of the fetus resulted in feelings of responsibility and altruistic changes in behaviour to ensure an optimum intra-uterine environment to promote healthy fetal development. This is demonstrated by changes the women in the quantitative phase of the study made to accommodate the special requirements of the fetus. In Cohorts 1 and 2 the greater majority of the participants reported making significant changes to their life-style. Many of the women stated that the fetus was an indivisible

part of them for whom they believed they had a responsibility for the fetus's continued health and well-being. This reinforced comments made during focus group discussion, when a member of the primigravid focus group stated *"I'm here to, sort of, carry it, to make sure it's alright and to not harm it in any way by what I drink or eat and where we go and different things"*.

This behaviour is sanctioned within pro-natalist society through proactive promotion of healthy childbearing practices. With the advice starting even before conception with women who are considering pregnancy encouraged to take folic acid supplements to prevent fetal anomaly (neural tube defects). During pregnancy women are expected to conform to professional advice to ensure the gestation and birth of a healthy baby and are judged by society as a whole as "unfit mothers" if their behaviours are considered deviant. This cultural influence exerted by the prevailing social, political, economic and demographic pressures has been found to profoundly affect childbearing (Main, 1990, Zimmerman and Doan, 2003). Women are socialised into protecting their pregnancy and ensuring the next generation is healthy. Government uses the pressure exerted by the women's instinctive need to protect, and societal expectations of conformity to promote healthy life behaviours within pregnancy, with pregnant women actively targeted for smoking cessation, drug rehabilitation programmes and screening for sexually transmitted diseases.

Society actively promotes healthy reproduction by the provision of services with which pregnant women are expected to comply. Government policy facilitates the healthy progression of pregnancy through a system of checks on maternal and fetal well-being and the promotion of a healthy lifestyle to ensure fetal growth and survival. The importance society apporitions to pregnancy and the accountability of women to their fetus, together with the natural instinct to protect ensures that women yield to surveillance of their pregnancy. Perhaps more insidiously the survival of the fittest has been more surreptitiously gained through the introduction and compliance with a national screening programme for fetal anomaly and termination of affected pregnancy - with Cuckle (1998) noting that the prevalence of babies born with neural tube defect has fallen by 95% since 1970. The woman's need to protect is exploited by society to ensure compliance and the ultimate birth of a healthy, normal child that will develop into a healthy adult.

Maternal-fetal attachment is indeed psycho-biological in nature with the biological drive to protect reinforced by social and cultural pressures to adapt behaviours to ensure wholesome childbearing practices and the birth of healthy progeny that will survive to meet their reproductive potential.

11.2 Challenging Condon's Framework of Adult Attachment

The generated definition of attachment challenges Condon's use of the phenomenology of adult attachment as the underpinning paradigm for his 1993 Maternal Antenatal Attachment Scale (MAAS). The phenomenology of adult attachment is based on the premise that the core experience of attachment is love. Two themes evident within this study fundamentally contest the use of adult attachment as a framework for understanding maternal-fetal attachment;

- firstly the pregnant women's strong assertion that their predominant emotional response to the fetus is protection, not love and
- Secondly that maternal-fetal attachment is developmental in nature and therefore cannot be equated to adult attachment that has by its nature been exposed to a life-time of interaction, experiences and interpersonal relationships.

These themes appear to be intrinsically linked. Protection may indeed be the beginnings of what Bowlby in 1958 identified as an affectional bond. This instinctive behaviour develops through covert interaction with the eventual sensory reality of the baby at its birth facilitating the progression into love.

The most pervasive theme from the data collected during one - one interviews and discussion at focus groups was that the most powerful feeling / emotion the women had towards their fetus was one of protection not love.

They could not explain where the feeling of protection emanated but believed it to be instinctive, a need to ensure the survival of their fetus. Throughout this study there is evidence to support the findings of many earlier studies that attachment is developmental in nature. The emotional attachment the women had towards their fetus gets stronger as pregnancy progresses and the fetus makes its presence known through increasingly stronger and recognisable movements. Grace (1989) found in a longitudinal study of 69 pregnant women who completed Cranley's Maternal Fetal Attachment Scale (MFAS) at monthly intervals that maternal-fetal attachment increased over time and in response to progressive fetal movements. This supported the earlier findings of LoBiondo-Wood (1985) whose longitudinal study of 100 women tested once during each trimester of pregnancy found that the MFAS increased as pregnancy developed with the greatest increase following quickening (maternal recognition of the first fetal movements).

Although the women described pregnancy as special, having an exclusive and intimate relationship with their fetus, none would describe the emotion as love. Love it was generally held was an intense positive emotional response to a tangible person / living creature, love would happen when they could hold, see, smell, hear and stroke their baby. This supports the premise of Della Vedova *et al.* (2008) that attachment is a developmental concept, starting with acquaintance, progressing slowly as the pregnant woman gets to know her

fetus through intimate physical and technical interactions to the reality of the baby at birth when sensori-motor interactions intensifying the relationship. One woman explained that "*... its not love yet ... that grows when it is in your arms*"; another said "*Love will come when you can see and hold it ... cuddle and kiss it*". This suggests that although the unique relationship between the pregnant woman and her fetus is special, for love the women need the stimulation of all senses evoked through physical contact.

Main *et al.*, (1985) stated that attachment was a developmental process that continues throughout a person's life. It must therefore be influenced by getting to know the attachment figure which is stimulated by hundreds of life experiences and shared intimate moments. Adult attachment therefore is composed of a lifetime of psychological and social experiences, a relationship developed through close, private interactions and intimate knowledge of the attachment figure, who is acknowledged as an independent being. This is very different from the pregnant woman's experiences of the fetus, a hidden, dependent life that can only be brought to physical reality by the woman's creative conscious thought. Zachariah (1994) in her empirical study of 115 pregnant women explored the affects of intergenerational attachment on pre-natal attachment. It is clearly stated that maternal-fetal attachment is different from adult - adult attachment, suggesting that maternal-fetal attachment is "narcissistic" and "possessive" (p 42). She further argues that

adult attachment occurs between two individuals who have intimate knowledge of each other and allow each other space within their lives. Redshaw (2006) supports the premise that it is difficult to relate prenatal attachment to attachment at any other time, suggesting that the maternal-fetal attachment relationship takes a different form prior to birth. This is further espoused by Della Vedova *et al.* (2008) whose study assessing prenatal attachment in 214 Italian women concluded that the affectionate relationship between a woman and her fetus is unique, not like any other attachment relationship.

Muller (1992) in her study to develop a prenatal attachment inventory identified that pre-natal attachment was indeed unique and involves a woman restructuring her life. Muller concluded that maternal-fetal attachment was progressive and may take the whole gestation period to fully develop. The pregnant woman's experiences of her fetus are gleaned from either the visceral sensations of fetal movement or from the use of technical apparatus to visualise the fetus or hear its heart-beat. She must use her imagination to conceptualise her fetus - she is in the process of falling in love but needs the physical reality of the baby in her arms to secure this process. Therefore maternal-fetal attachment cannot be compared with adult attachment, it is in essence work in progress - the beginnings of a relationship that will in most cases last a life-time.

The worth of love as the framework on which to generate items is further contested by Condon's own factor analysis of the MAAS questionnaire which has shown that the items load on only two factors instead of the five dimensions of love from which Condon generated the items, suggesting that the paradigm has not been reflected within the tool. Therefore the value of the adult attachment paradigm underpinning Condon's MAAS is seriously challenged and questions the basis for interpreting data and making judgements based on this tool.

11.3 Maternal-fetal attachment is characterised by protection, not love

The most pervasive theme that emerged from both the qualitative and quantitative phases of the research was that the primary emotion commonly felt by the women within the study was that of protection, not love. A member of the multiparous focus group said *"I feel protective more than anything else; I'd be devastated if anything happens"*. The participants within the qualitative study stated that almost from the beginning of pregnancy they had an innate and irresistible desire to protect the developing embryo / fetus. Although the women do not perceive their feelings for the fetus as love, they describe the fetus as *"special"* and *"precious"*. Most women believe the fetus to be *"part of me"*, a very special being for whom they have ultimate responsibility *"... you're looking after a third being now"*. This responsibility

provokes the need to protect and ensure survival of the fetus. This finding is supported by Salisbury *et al.* (2003) who state that the women demonstrate their commitment to the fetus through altruistic behaviour change to protect the fetus from potential harm. It is further suggested by Salisbury *et al.* (2003) that this commitment to the fetus is demonstrated through the women stroking their bellies to comfort their fetus, a behaviour that is also reflected by the women within both phases of the current study with the women stating that they stroke their pregnant abdomens to reassure their "baby" of their utmost attention. The relationship is viewed as intimate and exclusive. Only the woman can feel the movements of the life within and she can choose when and if to share the dyads secret encounters. Yet this special intimate relationship is surreal, necessitating the reality of the birth and physical presence of the baby to fully stimulate all the senses in order for the women to feel love.

Indeed Bowlby (1969) equated the attachment relationship to falling in love, by definition a gradual process that has not yet fully developed. Indeed Bowlby further suggested that the attachment relationship develops through reciprocal interactions, evoked through physical and overt behaviours occurring between primary caregiver and the baby following birth - with the clinging and calling behaviours in the newborn evoking caring behaviours in the adult, which Bowlby envisaged as an instinctive response. Mercer & Ferketich

(1990) found that the love develops as both parties within the dyad gain reciprocal pleasure from the synchronicity of their interaction further strengthening their relationship. It is argued that pregnancy is the precursor to this love relationship. This supports Goulet *et al.* (1998) premise, generated from their concept analysis of the literature available on maternal-fetal attachment, that pregnancy is the acquaintance phase within the developing relationship. The woman gradually "gets to know" her fetus through technical visualisation, the growing intensity of fetal movement and apportioning characteristics to fetal behaviour patterns. However this needs a cognitive leap to consider the fetus as a baby in her arms, imagining its looks, smell and touch. Sensori-motor interactions at birth are the stimulus that allows acquaintance to progress.

But what is love? This concept is poorly defined within the English language and over-used! After exploring many different sources the consensus of opinion is that love is eminently difficult to define, suggesting that the word itself has many different meanings and many different levels of intensity of feeling. John Alan Lee (1977) asked adults to explain what love meant and produced a theory of Love Styles, which gave six basic meanings (www.cyberparent.com). The six categories Lee defined were *eros* (passionate, romantic love); *ludus* (love as a playful game); *storge* (affection that gradually develops, based on getting to know); *pragma* (pragmatic love);

mania (highly emotional, unstable, dependent and possessive) and *agape* (selfless altruistic love). Storge would appear to be different to the others, a precursor, a gradual getting to know someone, with affection slowly developing into a deeper relationship. Affection suggests fondness, kindness and liking rather than the deep, emotional, fervent feelings associated with love. Indeed Bowlby (1958) equates the developing attachment relationship to affectional ties or bonds. From the results of the study it is argued that maternal-fetal attachment is the beginnings of a relationship that will develop into love when the baby's birth allows the emotional and physical interaction that Lee (1977) suggests are necessary within a love relationship. Maternal-fetal attachment it is argued is a precursor to love. Pre-natal attachment develops as the woman slowly becomes familiar with her fetus, through ultrasound visualisation and its progressively strong movements. This involves her own cognitive interpretation and not as in a love relationship overt, reciprocal physical behaviours. This is supported by qualitative research by Dykes & Stjernqvist (2001) who interviewed 10 primigravid women 1 week before and 1 week after ultra-sound scan. It was found that although following the scan women described their fetus as more real and more individual it did not alter their pre-existing image of the "eventual child". Indeed some women refused to envisage the baby at birth preferring to await the arrival of a healthy baby. This suggests that for the pregnant women there is a cognitive

difference between the fetus and the reality of the baby at birth. It is difficult to feel love for something that is an imagined being who still must encounter the dangers of surviving its birth.

The woman feels affection and the need to protect, not the all consuming emotion most often equated to a love relationship. Protection is an inherent response to shield from danger or injury; defend or to preserve in safety - it is not necessarily related to love, it emanates from a responsibility and as such describes the woman's emotional responses to pregnancy and the developing fetus. Both Bowlby and Ainsworth used the term affectional bond to describe attachment, with Bowlby (1969) suggesting attachment was the antecedent to adult love. It is therefore postulated, from evidence gathered during this study and consideration of earlier findings, that maternal-fetal attachment is not love, it is a natural state that results in a commitment to protect the fetus and as the woman gradually becomes acquainted with the fetus she develops an affectional tie. This may develop into love when all her sensations are excited by her baby following birth and she learns to respond to its physical reality. To reflect Bowlby's assumption maternal-fetal attachment is an affectionate state, an important precursor to love, but is not as yet love!

11.4 The developmental nature of maternal-fetal attachment

Attachment has been described as developmental in nature, with the intensity of emotions felt towards the fetus progressing as the fetus develops and becomes more tangible. Cannella (2005) in her integrative review of studies on maternal-fetal attachment published between 1981 and 2004 found consistent evidence to support the premise that attachment gets progressively stronger as the fetus develops - following her investigation of 25 longitudinal studies, 20 clearly demonstrated statistically that attachment was developmental in nature. Phipps & Zimm (1986) in a prospective longitudinal study of 72 women who completed the Maternal Fetal Assessment Scale during their 3rd, 4th and 5th months of pregnancy found a significant increase in Maternal-fetal attachment score. Similar results are reported by LoBiondo-Wood (1985) whose longitudinal study of 100 pregnant women sampled at 4 - 11 weeks, 12 - 16 weeks and 21 -26 weeks showed MFAS scores progressively increasing as the pregnancy develops. Grace (1989) also found attachment to be a developmental process in her study that measured attachment with the MFAS completed 5 times during pregnancy. This study supports these findings; Cohort 1 (200 women within their second or third trimester of pregnancy) was divided into three gestational groups - 19 - 26 weeks gestation (trimester 2), 27 -33 weeks gestation and 34 weeks gestation to term (trimester 3), it was found that overall gestation has a

significant effect on maternal-fetal attachment score, with attachment scores increasing as the fetus develops.

Qualitative data analysis particularly supports the supposition of Raphael-Leff (1991) that attachment develops in three progressive stages - belief in the pregnancy, belief in the fetus and finally belief in the baby. Raphael-Leff suggests that within the first trimester women "oscillate between feeling totally overwhelmed by the pregnancy on some days and totally unaware of it on others" (p. 62). Most women simply feel nauseous and tired, awaiting for tangible signs of pregnancy and the 12 week watershed that generally heralds that the pregnancy is viable and will continue. The second trimester proclaims the growing belief in the viability of the fetus, as the woman is able to see the fetus through the medium of ultra-sound scans and feel the fetus as its movements become stronger and more discernable as "kicks". This phase Raphael -Leff identifies as the developing belief in the fetus, as the woman gradually becomes acquainted with her fetus, becoming her "imaginary friend" (p.71) and she apportions characteristics to the fetus stimulated by visualisation and the character / timings of its movements. The third trimester is the culmination of pregnancy, attachment has reached a stage of constancy (Siddiqui *et al.*, 1999) and the woman recognises that the fetus is now capable of surviving its birth. Qualitative and quantitative findings within this study clearly identify Raphael-Leff's maturational phases

- the women progress from ambivalence and fear of losing their pregnancy, to gradually getting to know their fetus until within the last few months of pregnancy the fetus becomes a "real little person" and the women begin to prepare to meet their baby at their birth.

Analysis of interviews identified the first trimester of pregnancy as a period of ambivalence and worry; generally excited by the confirmation of pregnancy, this was followed by period of disbelief with no physical proof of pregnancy exacerbated by the general feelings of infirmity that characterise the early weeks of pregnancy. This was corroborated in focus group discussion by primigravid and multiparous participants stating "*I thought it (pregnancy) was unbearable I just felt sick and really tired*" (primigravid group member), "*I was constantly sick with headaches*". They anxiously await the ultra-sound scan that will confirm their pregnancy and the viability of the fetus.

It is the technical visualisation of the fetus on the early dating ultra-sound scan (USS) that confirms the reality of pregnancy and the signals the beginning of the acquaintance phase - a multiparous woman stated during her interview "*That (USS) brought it home that it was real ... 'cause it actually looked like a little baby*". Dykes & Stjernqvist (2001) conducted a qualitative study to evaluate the importance of ultra-sound scans (USS) to the women's thoughts about their fetus - 10 primigravid women were interviewed one week

before and one week after their first ultra-sound scan. It was found that with the woman receiving external verification of the life within, the fetus became more real, an individual – following USS the women became more positive, expressing closeness to the fetus and making positive health decisions to benefit the fetus. Dykes & Stjernqvist (2001) suggest that ultra-sound scans actually hasten progression to Raphael-Leff's second maturational phase – belief in the fetus. The quantitative phase of the current study confirms these earlier findings with over half of the participants in Cohorts 1 and 2 stating that they considered the fetus as a baby following its visualisation on the first ultra-sound scan. During the second trimester of pregnancy attachment is enhanced by evidences of fetal viability – the woman's developing and progressively burgeoning pregnant belly, the increasing strength and awareness of fetal movements, technical visualisation on USS and hearing the rapid fetal heart beat through the sonic-aid. One interviewed primigravid woman said *"As the pregnancy develops the stronger the heart gets ... and it becomes more precious"*. Quantitative data collection during validation of the Maternal Fetal Attachment Tool found that the majority of women conceptualise the fetus as a "real little person" within the first two trimesters of pregnancy.

All women within the qualitative phase of the study stated that fetal movements were particularly important, allowing them to interact with their

fetus and apportion characteristics to the fetus, one multiparous participant said " *The movements are slower and more peaceful, I think this one is like me, a little laid back*". Fetal movements also confirm to the women fetal wellbeing, with movements welcomed of a sign that all is well with the life within " *I like to wake up in the morning, it gives a kick and I think - oh it's OK*" (multiparous woman). The women identified movements as an intimate form of communication shared only, unless she chooses, with herself and her baby " *I think it's lovely (fetal movements) ... it's something you have that only the two of you know ... the baby moves and it's only you and the baby*" (primigravid woman). The women often respond to movements by stroking or fondling their belly - reassuring the fetus of their special attention " *When it moves I have to sort of reassure it and say yes, I know you're there and you're not on your own*" (primigravid woman), a multiparous interviewee said " *You talk to it and rub it ... if it gets agitated you can, sort of, calm it down*". Fetal movements have proved to be important factors within the development of attachment in many empirical studies - LoBiondo-Wood's (1985) longitudinal study of 100 pregnant women found that the greatest increase in maternal-fetal attachment as measured by Cranley's Maternal Fetal Assessment Score (MFAS) followed quickening - the first time the woman experienced and identified fetal movements. The importance of fetal movement within the development of attachment is supported by Heidrich & Cranley (1989). In a

prospective, longitudinal study of 91 women tested at 16 and 20 weeks gestation in a normal pregnancy, having divided the cohort into 3 groups (19 women had an amniocentesis; 37 had an ultra-sound scan; 35 had neither), that fetal movement interactions were positively correlated to higher maternal-fetal attachment scores; ultra-sound scan did not appear to have any effect on attachment. From this Heidrich & Cranley concluded that although technological media are valuable it is not as effective a stimulus as the woman's own bodily experiences. This conclusion needs to be re-evaluated in the 21st Century when technical visualisation by three dimensional ultra-sound scan is very life-like and generates a photograph of a recognisable baby-like fetus giving real evidence of the fetus. It should also be noted that Heidrich & Cranley used Cranley's Maternal Fetal Attachment Score which many researchers have identified as giving inconsistent results. Heidrich & Cranley (1989) found that the women who experienced fetal movements earlier in pregnancy scored higher on the attachment scale. Fetal movements are important to the women in their quest to protect their fetus, they provide evidence of the life within, demonstrate fetal well-being and act as a type of communication - with the women often stroking their abdomen to offer comfort to the fetus; it is not therefore surprising that movement facilitates and enhances the attachment relationship.

As pregnancy progresses the fetus takes on characteristics resulting from how, when and in response to what the fetus appears to move. These characteristics apportioned by attentive parents were found by Benoit *et al.* (1997) to continue forming the basis of their infant's personality following birth. As the woman's pregnant abdomen reaches term the woman gets ready for birth and meeting the baby that up to this time she has only been able to conceptualise " *We've talked about what we'd like the baby to look like ... and obviously whether it will have ginger hair!*" (primigravid participant). This cognitive ability to conceptualise the fetus as an independent being is facilitated through a progressively developing attachment relationship and is fundamental to the woman's successful transition to parenting (Doan & Zimmerman, 2003).

The physical and technological cues that stimulate and enhance attachment all occur within the first and second trimester, supporting the premise that attachment is well developed by the final trimester of pregnancy. To further test this hypothesis the 200 women of Cohort 1 within the late second and final trimester of pregnancy were divided into 3 groups of increasing gestation. It was found that the Maternal-Fetal Attachment Tool score for 19 - 26 week gestation (second trimester) differed significantly from 27 - 33 weeks gestation and 34 weeks gestation to term; but there were no significant differences in the maternal- fetal

attachment score between 27 – 33 weeks gestation and 34 weeks gestation to term. This result suggests that although maternal fetal attachment is developmental within the first two trimesters of pregnancy it appears to remain fairly constant within the final trimester.

It could be argued that the developmental nature of maternal-fetal attachment is underpinned by the notion of the "gestation of a person" with the woman gradually getting to know her fetus and apportioning characteristics to her expected baby. There needs as suggested by Della Vedova *et al.* (2008) a maternal awareness of her fetus in order for her to make a cognitive picture of her fetus. The unfolding world and characteristics of the fetus through technical cues and physical sensations allows the woman to slowly become acquainted and develop a relationship. This is affected by many factors and may be interrupted by fears that her pregnancy is unwanted or threatened. The third trimester is characterised by strong and regular physical sensations proclaiming the viability of her fetus and expectations that she will soon meet the real person.

Siddiqui *et al.* (1999) theorised that a woman's emotional state stabilises within the final trimester of pregnancy to synchronise with the body's substantial adaptation to the physical changes necessitated by maintaining a pregnancy and the demands of a rapidly growing fetus. It is postulated that as attachment is an emotional construct the stability of the woman's

emotional state would facilitate the conceptualisation of the fetus as a baby leading to the culmination of prenatal attachment and a period of stability. This was tested on Cohort 2, 150 women all within the final trimester of pregnancy. The Cohort was divided into 4 groups for comparison: 27 -30 weeks pregnant; 31 - 34 weeks pregnant; 35 - 38 weeks pregnant and 39 - 41 weeks pregnant. It was found that gestation, within the final trimester, had no significant effect on maternal-fetal attachment score, suggesting that attachment was indeed stable within the final trimester of pregnancy. Canella (2005) found in her integrative literature review of all papers on maternal-fetal attachment published between 1981 and 2004 that two longitudinal studies showed that maternal-fetal attachment within the final trimester of pregnancy correlates with maternal-fetal interactions on the second and third post partum days (Fuller, 1990; Mercer & Ferketich, 1990) and with maternal competence at one and eight months post-natally (Mercer & Ferketich, 1994; Mercer & Ferketich, 1995). This is an important finding with particular clinical significance within the care and support of the dyad post-natally. If maternal-fetal attachment is found to be low within the third trimester of pregnancy interventions can be planned to enhance attachment. Clinical interventions to improve and develop attachment were found to be beneficial in Carter-Jessop's (1981) observational study of 10 primigravid women within the final trimester of pregnancy. It was found that interventions

significantly positively affected attachment behaviours at 2 - 4 days post-partum, with attachment behaviour in the experimental group twice that of the control group.

11.5 The effects of parity on maternal-fetal attachment

This study has found that parity (the presence of existing offspring) has a fundamental effect on maternal-fetal attachment scores. Earlier studies on the effects of parity on maternal-fetal attachment have not given consistent results. Grace (1989) in a prospective, longitudinal study of 69 pregnant women who completed Cranley's Maternal Fetal Attachment Scale (MFAS) 5 times between 12 weeks gestation and term found that multiparous women significantly scored lower than primigravid women; this is supported by Siddiqui *et al.*, (1999) who found in a cross sectional study of 171 pregnant women within the final trimester of pregnancy who completed modified Muller's Prenatal Attachment Inventory (PAI) that parity had a significant influence on maternal-fetal attachment with primigravid women significantly scoring higher for expression of fantasy and sharing pleasure. However Cranley (1981) found in a cross sectional prospective study of 30 women 35 - 40 weeks gestation utilising the MFAS no relationship between parity and attachment. Muller (1993) also found no relationship between existing children and maternal-fetal attachment in her study of 310 low risk women

between 14 and 41 weeks pregnant, measurement of maternal-fetal attachment was by PAI and MFAS. There would however appear to be more studies supporting the findings of the current research rather than refuting it, with Cannella (2005) in her integrative literature review of studies published on maternal-fetal attachment between 1981 - 2004 finding studies by Mercer *et al.*, (1988), Pascoe, Kototailo & Broekhuizen, (1995) and Mercer & Ferketich, (1995) all corroborating the conclusion that parity has a significant effect on maternal-fetal attachment, with multiparous women persistently scoring lower. The current study has shown consistently across both qualitative and quantitative phases that multiparous women have a different experience of the fetus that is mediated by the existing pressures of family life. The scores for maternal-fetal attachment within both rounds of validating the Maternal-Fetal Attachment Tool (MFAT) have shown significantly lower attachment scores for multiparous women. This is supported by the empirical findings of Haedt and Keel's (2007) study that found primigravid women scored significantly higher on maternal-fetal attachment compared to multiparous women. It would therefore appear that parity does have a significant effect on the experience of attachment.

It could be argued that it is not only the presence of children but also the previous experiences of pregnancy and childbearing that may impact upon their developing maternal-fetal attachment. Previous childbearing loss may

affect some women's experiences of pregnancy. When a subsequent pregnancy occurs the woman may doubt her ability to produce a live baby, entering the pregnancy with concerns that something will happen in this pregnancy too (Armstrong & Hutti, 1998; Cote-Arsenault, 1999; Armstrong, 2002). Armstrong & Hutti (1998) found that those women who had experienced loss exhibited greater levels of stress and anxiety together with lower maternal-fetal attachment scores. However Armstrong (2002) found that although within the group that had suffered a perinatal loss there was evidence of increased symptoms of depression and higher pregnancy specific anxiety, there was no significant difference within the levels of attachment to the other groups who had not experienced loss. Armstrong's (2004) cross sectional survey of 40 couples who had suffered a perinatal loss and were in the second trimester of a subsequent pregnancy supported Armstrong's (2002) study that the women reported increased depressive symptoms and higher levels of pregnancy specific anxiety. However an inverse correlation was found between pregnancy specific anxiety and maternal-fetal attachment, as anxiety increased maternal-fetal attachment scores lowered. This suggests that previous poor experiences of childbearing may also affect the woman's emotional response to her current pregnancy.

Qualitative data and analyses within this study provide insight into the experiences of multiparous women. The women all stated that this fetus was

as precious as their first baby but they no longer had the time to delight in the experiences of pregnancy as they must attend to the needs of their family as a priority. During focus group discussion one multiparous woman said *"I wouldn't say it's not as special as the others ... but you've just got to get on with it"*. Another woman said *"I know I can't get ill this time, I can't afford to let myself get ill, cos I've still got to look after my son!"* The women did try to find time within the day when they could snatch some intimate time to enjoy their fetus and luxuriate in fetal movements; one participant said *"The movements are slower and more comfortable, like stretching and turning. She seems calm and happy to be in my tummy"*.

The experience of fetal anomaly testing was also different. Although the women were protective choosing not to have tests that may cause miscarriage; they were more likely to have the initial anomaly screening. The women did not want to jeopardise their current pregnancy but they were acutely aware of the continuing impact of a disabled or ill child on the family: *"I always felt that the first baby you could cope with anything, but if you had a handicapped child afterwards it wouldn't be fair on the others"*. The women were also prepared to consider termination for fetal anomaly as they must now consider the effects of a handicapped child not only on family life but also the continuing responsibilities this may cause to existing children *"Yes, we would have terminated ... we wouldn't want to leave our son with a disabled"*

and dependent sibling". Parity and the pressures of family life must inevitably affect the woman's responses to the current pregnancy; the needs of existing children are ever present and must be considered and met.

Condon (1993) suggests that common sense would explicitly demonstrate that the existence of siblings must have some impact upon the women's experience of subsequent pregnancies. This is supported within the findings and conclusions of Zimmerman & Doan's (2003) study which compared maternal-fetal attachment in primigravid women, multiparous women and women with an existing child with Down's Syndrome; it was found that on Condon's frequency rating within the Maternal Antenatal Attachment Scale (MAAS) multiparous women scored less. It was concluded that this is not unreasonable as the multiparous woman must now by necessity divide her attention between the children she is caring for and the fetus she is carrying.

There is for multiparous women a need to commit to the responsibilities of parenting an existing offspring that may well be more real and pressing than the developing life within. Condon & Corkindale (1997) in a cross-sectional study of 238 women within their final trimester of pregnancy found that the woman's pre-occupation with her fetus was by necessity influenced by external factors - the needs of existing children, life-events, tiredness and how busy she was with the rigours of family life. Within the current study although multiparous women scored lower, their feelings for their fetus

were still intimate and exclusive. Women within the qualitative phase of the research described the fetus as being an indivisible "*part of me*" and that they had been "*careful*", "*concerned*" and "*anxious*" about the life within. The women's predominant emotion remained that of protection. This reflects the findings of Zimmerman & Doan's (2003) study which found that although multiparous women score lower on the frequency subscale of attachment, the quality subscale (which measures the degree of affection the woman experiences towards the fetus) remains constant for both primigravid and multiparous women, suggesting that their emotional attachment is as important and strong as with their first pregnancy. This should be considered when interpreting the MFAT scores. It would be more useful to consider the individual with the mean scores for multiparous women rather than making assumptions based on the mean scores with primigravid women, which would result in under estimating the attachment of multiparous women. The scores of multiparous women are honed by experience and family needs. The scores of the primigravid women could, as suggested by Doan & Zimmerman (2003), be the result of inexperience - idealising pregnancy and parenthood.

11.6 The influence of intergenerational attachment

Sroufe & Fleeson (1985) suggest that intergenerational attachment is an integral phenomenon within the life-long attachment relationship, with the

progressive development of a working model of attachment that in the adulthood becomes a blueprint for potential parenting. In the qualitative phase of the research it became evident that the support of parents was an important factor for the women. To further explore the importance of the intergenerational impact upon the women's attachment extra data were collected during the validation of the tool: three specific supplementary questions asking the women to rate on a scale of 1 to 10 their experiences of childhood and being parented (Appendices One & Three questionnaires used in Round 1 & 2) were added to the questionnaire. Analysis of both qualitative and quantitative data has supported the construct of intergenerational attachment. It was found that parents had a significant influence upon the pregnant women's developing attachment - this was found to be significant to both primigravid and multiparous women.

All the women within the qualitative phase of the research stated the importance of parental support; parents were the first people after the couple that shared the intimate and special news of pregnancy. Although both parents were viewed as important sources of support and parenting skills, the women particularly valued the "*supportive*" relationship of their mothers. This reflects the findings of Siddiqui *et al.* (2000) whose empirical study of 161 women within the final trimester of pregnancy to discover the effects of intergenerational attachment on the development of maternal-fetal

attachment found that the quality of the mother-daughter relationship was crucial to the pregnant woman's identification of self and successful transition to motherhood. However Zachariah's (1994) empirical study to explore the relationship between mother-daughter attachment and maternal-fetal attachment failed to find any relationship. However, both Zachariah (1994) and Siddiqui *et al.* (2000) dispute the results as inconsistent with the existing body of knowledge; they both cite the use of Cranley's Maternal Fetal Attachment Score (MFAS) as the cause of the confounding results. Siddiqui *et al.* (2000) use within their study Muller's Prenatal Attachment Inventory, stating that this measures effectively the mothers' emotions, attitudes and behaviours towards the fetus whereas Cranley's MFAS measures concerns about the pregnancy and infant-related thoughts not therefore successfully measuring maternal-fetal attachment and as a result producing inconsistent and inaccurate results. Therefore the worth and fundamental influence of the mothers - daughter on the pregnant woman's developing attachment relationship with her fetus is not questioned.

During interviews the majority of women said they were "*close*" to their mothers and valued this positive relationship. One woman wanted a girl so she could perpetuate the special relationship she enjoyed with her mother. Her mother had been particularly compassionate and accommodating during the trauma of a miscarriage "*... my mom was with me she was great ... it was nice*

having her around, especially when you don't really know what's happening!" It has been highlighted by Bowlby (1988) that women actively seek the attention and advice of their mothers within pregnancy. This has been supported within the findings of Cranley's (1981) empirical study to investigate the roots of prenatal attachment. Thirty women within the third trimester of pregnancy were interviewed to discover social support mechanisms. It was found that an essential source of support / "nurturance" (p.67) was gained from the women's mothers. All women within the study reported increased contact with their mothers particularly within late pregnancy, with several women reporting daily contact. Cranley also reported that the women sought advice and reassurance from their mothers, perceiving them as more experienced and able to provide pregnancy specific guidance. This is reflected within the results of the current study's focus group discussion when the women reiterated the importance of their mothers' practical support; with some mothers helping with childcare on a continuing basis and all mothers planning to provide extra care and assistance to the families during the weeks following the birth.

For the pregnant teenagers parental support was imperative as those under sixteen years of age had no other means of support. Bloom (1995) in a longitudinal study which followed 47, 12 - 20 year old from early pregnancy to 1 week post delivery stated that support was crucial as many of the younger pregnant teenagers were struggling to cope with extra physical and emotional

demands at a time when they were already suffering the stresses of adolescence and wrestling with their own identity crisis. With many of the pregnancies unplanned (Laxton-Kane & Slade, 2002; Macleod & Weaver, 2003; van Teijligen & Pitchforth, 2007) the pregnant teenagers had a very different experience of parental involvement - disclosing their pregnancy to parents was inherently difficult and frightening, with the majority of the participants feeling they had *"Let their parents down"*. One participant did not tell her parents she was pregnant until she was twenty weeks gestation and pregnancy became difficult to hide! Disclosure in all cases led initially to shock, confrontation, anger and distress. However most parents eventually supported their daughter's decision to continue with their pregnancy and provided personal, monetary and practical support. This is similar to results of Macleod & Weaver (2003) in their empirical repeated measures prospective study of 111 pregnant teenagers sampled at 20 and 37 weeks gestation, which found that for 80% of the participants their main social support was from either their mother or both parents. The participants within Macleod & Weaver's study all stated that they felt well supported and accepted during pregnancy. Mothers became a valued source of information and advice; often seen as the experts in pregnancy and childcare, supporting the findings of Cranley (1981). In a critical review of 23 papers (1990 - 2001) Laxton-Kane & Slade (2002) cite an empirical study by Wayland & Tate (1993)

that found adolescent maternal-fetal attachment scores correlate more significantly with perceived closeness to their mother than with the father of the baby; suggesting that for teenagers the relationship with their mother is most important. During the focus group discussion it became apparent that it was only as a result of parental acceptance and support that the girls were able to fully accept their pregnancy and look towards the future. Macleod and Weaver's (2003) empirical study supports these findings; satisfaction with social support provided by the significant people within the life of the pregnant teenagers showed a strong relationship with a positive attitude towards their fetus and their pregnancy

Results from analysis of data collected during the validation of the Maternal-fetal Attachment Tool (MFAT) demonstrate that there is a significant positive relationship between intergenerational attachment and maternal-fetal attachment. Within both cohorts there were significant positive correlations between the quality of the participant's relationship with their parents and the MFAT score. Doan & Zimmerman (2003) in their critical review of current research, in an attempt to identify the issues within the multi-dimensional view of maternal-fetal attachment, found a positive relationship between the woman's perceptions and memories of being parented with her level of prenatal attachment. An empirical study by Mikulincer & Florian (1999) explored the relationship between the woman's attachment

style, their levels of attachment, their mental health and their coping strategies throughout pregnancy. It was found women with demonstrating secure attachment had high levels of maternal-fetal attachment, expressed positive mental health and reported a coping strategy that involved seeking support; women with avoidant attachment showed low levels of maternal-fetal attachment and negative mental health in the first and second trimester, improving temporarily during the second trimester with a coping strategy involving distancing; those with an anxious ambivalent style showed a gradual increase in maternal-fetal attachment throughout pregnancy and reported negative mental health throughout pregnancy. It is therefore concluded that positive intergenerational attachment has a constructive effect not only on developing maternal-fetal attachment but also influences and promotes a healthy and satisfying pregnancy experience.

It is further proposed by Fonagy *et al.*, (1991) that there is a predictive relationship between prenatal assessment of the maternal representation of attachment style and the quality of maternal-infant attachment. Fonagy *et al.*, (1991) conducted a prospective study on 100 primigravid women within the final trimester of pregnancy to examine the association between the findings of women's Adult Attachment Interview and the Strange Situation assessment of maternal-infant attachment at 1 year. The results demonstrated that in 75% of cases the women's attachment classification

successfully predicted whether an infant would be coded as securely or insecurely attached to its mother at 1 year old in the Strange Situation. The Autonomous and Dismissing interview classifications powerfully predicted secure and avoidant classifications respectively. This further identifies the entrenched effects of intergenerational attachment on all subsequent relationships; it also highlights the need for positive supportive intervention to revisit experiences of intergenerational attachment that can be worked through to the benefit of the woman and her subsequent ability to form secure attachment to her child (Main *et al.*, 1985).

This study supports the hypothesis that intergenerational attachment has a positive relationship upon maternal-fetal attachment. It was also found in support of Durkin *et al.*, (2001) that positive reflections on childhood are facilitated by good quality relationship with parents. Results showed that within Cohort 2 there was a significant positive correlation between the quality of the intergenerational relationship and the amount of time childhood is reflected upon. This facilitates the transition from child to parent which Siddiqui *et al.*, (2000) found necessitated the woman being able to reflect upon childhood. Intergenerational attachment is therefore crucial within the development of maternal-fetal attachment and predictive of maternal-infant attachment. It should however be borne in mind that although the attachment internal model is resistant to change, it can be re-structured with

appropriate support, introspection and intervention to enhance secure maternal-fetal / infant attachment.

11.7: The importance of partner support

The psych-biological basis of attachment is clearly seen within the women's desire for a compassionate partner relationship. Attachment involves psycho-biological, social and psychological elements that are entwined and influential. Society has an expectation that all young people should reproduce, preferably within a supportive co-habiting relationship. Humans have been identified by Lovejoy (1981) as a k-species with a prolonged dependent period into pre-adulthood that necessitates enormous parental investment. MacDonald (1992) in his theoretical paper analysing the evolutionary origins of the developmental construct of "Warmth" stated that this need for high investment parenting necessitated increased levels of investment from the male with the dependent and helpless offspring benefiting from the support of two parents. In consequence society encourages romantic life-long pair-bonding, with the female supported through child-rearing by a compassionate partner. The women within the current research study actively encouraged their partners to vicariously take part within the pregnancy - seeking for their partners to care for them.

Throughout this research study, both within the qualitative and quantitative phases, there is evidence that partner support is important to the women. This supports the findings in Condon & Corkindale (1997), their empirical research involving 238 women within the third trimester of pregnancy found that compassionate, supportive partner relationships providing consistent high levels of care correlates positively with maternal-fetal attachment. For many couples the pregnancy is a joint venture, planned together and mutually overwhelming when the pregnancy was confirmed. Partners were encouraged by the women to participate within pregnancy by being actively involved within antenatal care, being part of the decision processes during screening tests, attending ultra-sound scans and palpating fetal movements; one multiparous woman whose previous pregnancy had sadly ended in miscarriage said *"My husband seems to enjoy feeling this one move more!"* Cranley (1981) found that practical support provided by their partner is especially valued - household chores, shopping, and generally paying close attention to the pregnant woman's health and well-being especially if this behaviour is new. It was also found by Condon & Corkindale (1997) that it was not simply the provision of support that was important, it is the woman's satisfaction with the quality of support provided that is most influential in promoting maternal-fetal attachment.

Main *et al.*, (1985) state that although early internal working models operate outside consciousness and are therefore resistant to change, they are not passive internalisations of past experience, but dynamic constructions and as such are capable of reconstruction. Redshaw (2006) supports this critical point suggesting that it is naive to conclude that experiences of poor parenting result in turn in difficulty attaching to their child. If the woman has the appropriate compassionate support to allow her to gain a clear insight into her own experiences of being parented she will be enabled to provide sensitive and responsive parenting. This is an important consideration for women who have insecure attachment; it was found by Isabella (1994) that the positive support of a sympathetic and accommodating partner can positively affect the woman's care giving functions providing a secure base from which the woman can explore and rectify her previous insecure attachment status allowing her to concentrate on her pregnancy and develop attachment to her fetus.

Partner support is essential for the majority of the women, with warm and happy relationships positively stimulating the woman's adjustment to pregnancy and her attachment to the fetus (George & Solomon, 1999). Partner support was crucial for two multiparous women who had not planned their pregnancy and indeed were unhappy (*"I was upset, I cried for a bit. It's the first one I've ever cried over"*, *"I'm too old to be having a baby ... I wanted*

my life back"); it was their partner's support that allowed them to gradually come to terms and accept their pregnancies. This reflects the findings of Siddiqui *et al.* (1999) who found, in their study to explore pre-natal attachment in 171 Swedish women within the final trimester of pregnancy, that the partners were influential to the woman's adjustment to pregnancy and her relationship with her fetus. Both married with families thought to be complete, the women did not want the traumas of pregnancy and early childrearing again! Their husbands remained calm, both relishing the prospect of new fatherhood again, one of the women said her husband "... *bought home a bunch of flowers and said "no more crying, let's get on with it"*, demonstrating as found by Siddiqui *et al.* (1999) that the partner's positive reaction to pregnancy significantly stimulated the woman's attachment to her fetus. This demonstrates that securely attached men within a supportive marriage type relationship can sensitively provide supportive care to facilitate attachment within their pregnant partner.

Conflict within partner relationships has been found to be directly related to maternal-fetal attachment problems. Isabella (1994) identified links between partner relationship quality and infant attachment; higher levels of relationship quality predict greater maternal role satisfaction, greater maternal sensitivity and greater attachment security for the child at a year old. Conflict was apparent for two of the interviewed women. Their partners

were not involved in pregnancy planning, were angry when told of the pregnancy and indeed wanted to terminate. The multiparous participant said she felt *"very isolated and alone"*, she had always wanted another child. Fortunately following counselling with the General Practitioner and ultrasound visualisation the father accepted the pregnancy and provided the loving support necessary to the development of attachment. Unfortunately for the primigravid participant, her husband became more and more remote with their relationship eventually breaking down *"... this baby has opened a can of worms"*. Her husband had experienced poor childhood relationships with his parents; this had continued into adulthood, the news that the fetus was a boy finally led to total rejection of both the pregnancy and his wife. This supports Belsky's (1999) assertion that the father's own attachment insecurities result in the father's inability or unwillingness to participate within the care-giving partnership failing to provide the support that is keenly sought by pregnant women. The primigravid woman almost at the end of her pregnancy was concerned about her ability to fall in love and provide for the entire baby's needs. This concern has been identified within the empirical work of Siddiqui *et al.* (1999) who found that the partner's perceived initial reaction and attitude to the pregnancy had a significant affect upon maternal-fetal attachment. Although her fundamental emotional response was to protect and nurture the fetus, she did blame the pregnancy for her

failed marriage and was concerned for her future. This reiterates the importance of a partner support. Support is more than emotional it must also involve the provision of a secure financial and social environment.

From data collected and analysed during the validation of the Maternal-Fetal Assessment Tool (MFAT) evidence found that marital relationships result in higher maternal-fetal attachment scores, suggesting that perceived permanent relationships are more supportive. Within Cohort 1 it was found that there was a significant effect of the independent variable marital status on the dependent variable MFAT score; married women scored significantly higher for maternal-fetal attachment than either single or co-habiting women. Although within Cohort 2 there were no significant differences between the maternal-fetal attachment scores for single and co-habiting women, married women scored significantly higher on the Maternal-Fetal Attachment Tool. This perhaps surprising result reflects findings reported by Doan *et al.* (2003). Wayland and Tate (1993) found a significant positive relationship between marital status and maternal-fetal attachment in adolescents and this was supported by Lindgren (2001) who also found a positive relationship between marital status and maternal-fetal attachment. A recent study by White *et al.* (2008) has also found that married women experiencing a high risk pregnancy score significantly higher on maternal-fetal attachment. This is an interesting finding in a society that

acknowledges and supports co-habiting relationships, when it is found that the security of marriage appears to provide the foundation that significantly promotes maternal-fetal attachment. This supports findings from Owens (1993) that reported that individuals within a secure heterosexual relationship reported stronger feelings for their partners and demonstrated a greater commitment. It is suggested that the security afforded by marriage allows the partners a greater sense of security, facilitating within the man the ability to provide loving support and within the woman a greater trust as her husband has already shown commitment by formalising their partnership.

11.8 Original contribution to the theory of maternal-fetal attachment

This study has contributed to the knowledge on maternal-fetal attachment. The first phase of the research used the lived experiences of pregnant women to explain from their perspective the meanings and emotions of maternal-fetal attachment. From the generated definition the multi-dimensional and inter-dependent elements of attachment are identified. Central to maternal-fetal attachment is the woman's desire to protect her fetus. Attachment is a very intimate and exclusive relationship that develops as the growing fetus becomes substantial and real. This relationship is facilitated by the quality of intergenerational attachment and partner

support and is enhanced through appropriate and realistic social support and cultural influences.

It has been established that maternal-fetal attachment is unique, and cannot be compared or measured against maternal-infant or adult attachment. Maternal-fetal attachment would appear to be the precursor to attachment; the acquaintance phase of the relationship. Perhaps the most significant finding is that attachment is not fundamentally based on love but founded on the woman's desire and compulsion to protect the unborn child. Women state that this emotional response is evoked very early in pregnancy and stimulates them to make behavioural changes to ensure the fetus has a favourable intra-uterine environment in which to grow and develop. The women feel a real responsibility for the continued well-being of their fetus. This supports the psycho-biological theory of attachment, that attachment supports survival and is an innate response resulting from biological, environmental and social influences.

This study has produced and validated a measuring tool for maternal-fetal attachment, which has an underpinning paradigm produced from the women's perceptions and experiences that allows interpretation. The tool has been rigorously tested and shown to be both reliable and valid. Through testing for face validity at every stage the tool is user-friendly with the

stems providing positive alternate responses; it is also short with only 17 questions which make it quick and easy to complete.

Conclusions

Within the first stage of the research process a qualitative stance was taken to explore the meaning of maternal-fetal attachment from the pregnant women's own perspective. Ten unstructured interviews were conducted which investigated the women's thoughts and emotions on the way they felt about the developing life within. The women gave freely of their time, with interviews lasting one to two hours. The participants appeared to enjoy the opportunity to talk freely of their pregnancy, saying it was the first time that they could fully indulge their passion for their pregnancy and really explain their feelings for their fetus which were at times all consuming. This was followed by debates within three small focus groups. This allowed findings to be corroborated and include thoughts from groups who were under-represented within the interview cohort - particularly young teenage girls. From analyses of the interviews and focus group discussion a definition of attachment was generated, which was used as a theoretical basis from which to develop items for a psychometric tool on maternal-fetal attachment. The most significant finding during this qualitative phase of the research is that attachment is not based as often postulated on love but on the need to protect the fetus.

The Maternal-Fetal Attachment Tool (MFAT) produced is based on a solid research based definition, a definition generated from the women's own perspective and therefore representative of the target population. This approach is one advocated by Muller (1993) who stated that the most appropriate framework to underpin a measuring tool for maternal-fetal attachment would be one that has been created from the pregnant women's own standpoint. Results have shown that maternal-fetal attachment is multi-dimensional in nature. The development of the affectionate relationship is dependent upon biological, social, cultural and personal factors that all influence the woman's ability to commit to her fetus. The definition has six main themes which facilitates understanding and interpretation of the findings. It is imperative within this acquaintance phase of the attachment relationship that a psychometric tool incorporates these factors in order to give a representative result.

The validation process of the questionnaire has allowed for further testing of the definition which has stood up to experimental scrutiny by a more generalised population. Maternal-fetal attachment in essence involves the woman's need to protect the fetus and ensure its survival. The emotion is exclusive and intimate; is developmental in nature and is facilitated by appropriate social support, especially that of a loving partner and supportive parents. A persistent finding is that maternal-fetal attachment is essentially

affected by existing children, with multiparous women persistently scoring lower than primiparous women. For this reason it is suggested that the scores of multiparous women are not compared to those of primigravidae but with other multigravid scores.

This psychometric tool has undergone statistically rigorous testing for reliability and validity; it has undergone more robust testing than the three psychometric tests that are most frequently used. The questionnaire has evolved through various pilot tests, tests for content validity, reliability and validity. The resulting questionnaire has simple instructions, is written in clear unambiguous language, and is relatively short and quick to complete. It is fit for purpose. It is envisaged that this questionnaire could be used for both clinical and research purposes.

Limitations to this research study

- The focus group for pregnant teenagers was very small, a larger group may have produced more discussion and may have clarified / substantiated points made.
- Although the sample is representative of the area within which the study was completed, the ethnic origin of most of the sample is White British. As well as the Midwifery-led Unit which serves a fairly white middle-class populace, the Antenatal Clinic of a large District General

Hospital serving a diverse urban and rural population was chosen in order to provide a more ethnically varied population. However despite purposeful sampling of ethnic minority groups attending clinic, the sample remained predominantly Caucasian in origin.

- It would have added to data analyses and conclusions if women who had suffered previous childbearing loss or were experiencing a high risk pregnancy were identified. This would have facilitated an investigation into how their experiences may have impacted on the results on the MFAT questionnaire.
- A large proportion of the women sampled were within co-habiting relationships, with results clearly showing that attachment is enhanced within a marital relationship. It is possible that the preponderance of women within a co-habiting relationship may have skewed the results. However statistical analyses found not only that maternal-fetal attachment scores were higher within a co-habiting relationship, but the highest scores were found within a marital relationship. These results are consistent with findings in many previous empirical studies (Isabella, 1994; George & Solomon, 1999; Siddiqui *et al.*, 1999; Doan *et al.*, 2003, White *et al.*, 2008). It is not therefore an unwarranted conclusion, but one that supports previous research findings.

- Although not part of the questionnaire further questions relating to intergenerational attachment would have added to the data. A couple of extra question could have clarified the affects of childhood experience on adulthood. An open-ended question could have asked "how" their experiences of childhood had affected them as an adult. A further question on whether these experiences will affect the way they chose to parent would also of clarified the responses.

Further Research

This study has stimulated a desire to discover more about the developing relationship between the woman and her offspring. Further research would involve future developments of the MFAT instrument. There are also many areas of maternal-fetal attachment and attachment that would warrant further investigation:

- The MFAT questionnaire could be further developed through testing on more diverse populations - with purposeful sampling of pregnant women in ethnic minority groups, within inner city areas and who are teenagers. Due to the nature of the population served by the NHS Hospital Trust in which the research was ethically approved, the majority of the indigenous population is white British or European. Most women are

within co-habiting relationships and teenage pregnancy although apparent does not reflect national levels.

- The MFAT instrument could be used to assess levels of attachment with women who have experienced childbearing loss to investigate whether loss has any deleterious effects on attachment. Also whether the women believe that the questions are pertinent and reflective of their perception of their attachment. Childbearing loss may have a significant impact on maternal-fetal attachment scores. The use of the MFAT together with some qualitative investigation could be combined to discover the impact of loss on the current pregnancy and ascertain from the women their needs at this time in order to identify appropriate support mechanisms.
- Follow this study with similarly structured empirical research to produce a maternal-infant attachment tool - starting with a definition generated from the women's experiences, using this as a foundation for the production of valid items and then progressing to a rigorous validation process. With the use of similarly validated attachment tools the relationship between maternal-fetal attachment and maternal-infant attachment could be explored. To discover the potential changes within the relationship it would be useful to

undertake a longitudinal study to follow a cohort from early pregnancy through the first year of life.

- Young teenage mothers - further qualitative and quantitative research to explore the development of attachment in this unique group. An interesting finding within the focus group discussion was that unlike more mature women the teenagers never considered the tentative nature of pregnancy, a phenomenon that concerned all other women particularly until 12 weeks gestation when the women generally believed the pregnancy was viable. It would be interesting and important to investigate any other differences, which would be valuable for clinical practice, especially within a group known to have difficulty with childrearing, with higher incidences of infant mortality and abuse (DfES/DoH, 2004, Hutchinson, 2007).
- It would be useful to identify those women who produce low maternal-fetal attachment scores and then sensitively interview them regarding possible causative factors for their lower attachment scores. This would provide valuable data to identify need and target appropriate support to facilitate the development of an attachment relationship.
- To use the Maternal-Fetal Attachment Tool (MFAT) to explore the implications on the attachment relationship during screening for fetal anomaly, particularly invasive screening tests. Invasive tests are

suggested when an identified higher risk of congenital anomaly is evident. It has been suggested in studies (Caccia *et al.*, 1996; Cuckle, 1998) that this leads in some cases to the women with holding attachment, attempting not to get too emotionally involved in a pregnancy that they may by necessity choose to terminate.

Summary of the main conclusions drawn from this study:

- A definition drawn from the women's own perceptions and experiences will accurately reflect the true nature of maternal-fetal attachment
- The generated definition clearly sites maternal-fetal attachment within the psycho-biological approach to psychology.
- Maternal-fetal attachment is a unique relationship that is fundamentally different from any subsequent attachment relationship. It is the acquaintance phase within the life-long relationship. As aptly described by Benedek (1959) the "gestation of a person", during which biological, social, cultural and personal factors will impact and inherently affect the relationship. Therefore to accurately measure attachment these factors must be reflected within the assessment

- The protective nature of attachment ensures behavioural change to guarantee a good intra-uterine environment for optimal fetal development.
- The predominant emotion experienced by women towards their fetus is protection, an affectional bond that develops into love following the water-shed of birth. Women do not feel love until their baby is a sensory reality within their arms. It is the sight, smell, and fondling of the baby that excites the need to care and love the child.
- Maternal-fetal attachment is developmental in nature. The ambivalence to the pregnancy experienced by many women within the first trimester is transformed by physical and technical cues during the second trimester that allow the woman to cognitively appreciate that the pregnancy has become viable. Within the final trimester the body and mind has accommodated to the pregnancy and attachment progresses to a plateau, becoming constant in nature.
- The prenatal attachment relationship is intimate and exclusive. The women choose with whom to share the intimacies, generally to provoke caring behaviours within those acting as social support, suggesting at this stage within the attachment relationship the bond is monotropic.
- Positive intergenerational attachment encourages the pregnant woman to reflect on her childhood experiences. This deliberation upon

parenting actively facilitates the emotional leap from child (the protected) to parent (the protector).

- Consistent loving partner support facilitates the development of attachment. It was found that marriage has a positive link to the development of maternal-fetal attachment.
- Personal experiences of the pregnancy are important within the development of this unique attachment relationship.
- Previous childbearing experiences and the existence of children impacts on the maternal-fetal attachment score. Although parous women are still protective and maintain exclusive intimate relationships with the fetus, their previous experiences of pregnancy, the demands of existing children and possible consequences to family life must be considered.
- The definition underpinning the formulation of the maternal-fetal attachment tool is multi-dimensional in nature and provides a basis on which to interpret findings.
- The Maternal-Fetal Attachment Tool can be used for both research purposes and clinical evaluation.

The generation of this comprehensive definition has provided the validated Maternal-Fetal Attachment Tool with a solid framework on which to

base understanding and interpretation of results. The definition has contributed to and extended the knowledge base for maternal-fetal attachment, particularly the finding that the main emotion is a desire to protect the fetus from harm and ensure its survival to become a healthy baby. The prenatal attachment relationship is unique. It is an affectionate bond that is the precursor to the infant and adult attachment relationship. It is acknowledged that maternal-fetal attachment is multi-faceted with interdependent biological, social and psychological elements combining to allow the woman to progressively develop a potent attachment relationship with her fetus. The tool to measure such a complex concept must reflect the interdependent nature of this unique relationship.

The reliability and validity of the final Maternal-Fetal Attachment Tool has been clearly demonstrated, having been subjected to rigorous statistical scrutiny. The tool is user-friendly, with clear instructions and reasonably quick to complete due to its option-ranked responses that are plausible and coherent and the limited number of items. Unlike existing tools there is a well-founded definition that underpins the psychometric tool which withstands statistical scrutiny and as such facilitates accurate interpretation of the results of the Tool. The MFAT questionnaire measures both emotional and behavioural aspects of maternal-fetal attachment and as such can be used effectively as a single measurement of the construct.

Reference List

Ader, R. and Cohen, N. (1993). Psychoneuroimmunology: Conditioning and Stress. *Annual Review of Psychology*, **44**, pp. 53 - 85.

Ainsworth, M. D. S. (1963). The development of infant-mother interactions among the Ganda. in Floss, B. M. (ed.) *Determinants of infant behaviour*. New York: Wiley, pp. 67 - 112.

Ainsworth, M. D. S. (1967) *Infancy in Uganda: Infant care and the growth of love*. Baltimore: John Hopkins University Press.

Ainsworth, M. D. S. (1969) Object relations, dependency and attachment: A theoretical review of the infant-mother relationship. *Child Development*, **40**, pp. 969 - 1025.

Ainsworth, M. D. S. (1982) Attachment: Retrospect and prospect. in Parkes, C. M. and Hinde, J. S. (eds.) *The place of attachment in human behaviour*. New York: Basic Books, pp. 3 - 30.

Ainsworth, M. D. S., Blehar, M., Waters, E. and Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.

Ainsworth, M. D. S. and Wittig, B. A. (1969) Attachment and the exploratory behaviour of one-year olds in a strange situation. in Foss, B. M. (ed.) *Determinants of Infant Behaviour*, **4**, New York: Wiley, pp. 113 136.

Ammaniti, M. (1994). Maternal representations during pregnancy and early infant-mother interaction. in Cassidy, J and Shaver, P. R. (eds.) *Handbook of Attachment. Theory, Research and Clinical Applications*. New York: The Guilford Press, pp.649 - 670.

Archavsky, I. A. (1952). Immediate breast feeding of newborn infants in the prophylaxis of the so called physiological weight loss. in Simpson, J. A. (1999) Attachment Theory in Modern Evolutionary Perspective. In Cassidy, J and Shaver, P. R. (eds.) *Handbook of Attachment. Theory, Research and Clinical Applications*. New York: The Guilford Press, p 115 - 140.

Armstrong, D. S. and Hutti, M. (1998). Pregnancy after perinatal loss: The relationship between anxiety and prenatal attachment. *Journal of Obstetric, Gynaecological and Neonatal Nursing*, **27**, pp. 183 - 189.

Armstrong, D. S. (2002). Emotional distress and prenatal attachment in pregnancy after perinatal loss. *Journal of Nursing Scholarship*, **34**, pp. 339 - 345.

Armstrong, D. S. (2002). Impact of prior perinatal loss on subsequent pregnancies. *Journal of Obstetric, Gynaecology and Neonatal Nursing*, **33**(6), pp 765 - 773.

Ballou, J. W. (1978). *The psychology of pregnancy*. Lexington: Heath.

Beck, C. T. (1999). Research on Prenatal Attachment and Adaptation to Pregnancy. *The American Journal of Maternal and Child Nursing*, **24**(1), pp. 25 -32.

Belsky, J. and Cassidy, J. (1994). Attachment: Theory and Evidence. in Rutter, M. and Hay, D. (eds.) *Development through life: A handbook for clinicians*. Oxford: Blackwell, pp. 373 - 402.

Belsky, J. (1999). Modern Evolutionary Theory and Patterns of Attachment. in Cassidy, J and Shaver, P. R. (eds.) *Handbook of Attachment. Theory, Research and Clinical Applications*. New York: The Guilford Press, pp. 141 - 161.

Benoit, D., Parker, K. C. H and Zeanah, C. H. (1997) Mother's representation of their infants assessed prenatally: Stability and association with the infant's attachment classification. *Journal of Child Psychology and Psychiatry*, **38**, pp. 307 - 313.

Berlin, L. J. and Cassidy, J. (1999). Relations among Relationships: Contributions from Attachment Theory and Research. in Cassidy, J and Shaver, P. R. (eds.) *Handbook of Attachment. Theory, Research and Clinical Applications*. New York: The Guilford Press, pp. 688 -712.

Bhaskar, R. (1989) *Reclaiming reality: a critical introduction to contemporary philosophy*. London: Verso.

Bibring, G. L. (1959). Some considerations of the psychological process in pregnancy. *Psychoanalytical Study of the Child*, **14**, pp. 113 -121.

Bielawska-Batorowicz, E. and Siddiqui, A. (2008). A study of prenatal attachment with Swedish and Polish expectant mothers. *Journal of Reproductive and Infant Psychology*, **26**(4), pp 373 - 384.

Bloom, K. C. (1995). The development of attachment behaviours in pregnant adolescents. *Nursing Research*, **44**, pp 284 288.

Bloom, K. C. (1998). Perceived Relationship With the Father of the Baby and Maternal Attachment in Adolescents. *Journal of Obstetric, Gynaecology and Neonatal Nursing*, **27**(4), pp. 420 -429.

Bowlby, J. (1951). Maternal care and mental health. *World Health Organisation Monograph (Serial No 2)*

Bowlby, J. (1958). The nature of the child's tie to his mother. *International Journal of Psycho-Analysis*, **XXXIX**, pp. 1 - 23.

Bowlby, J. (1959). Separation Anxiety. *International Journal of Psycho-Analysis*, **XLI**, pp. 1 -25.

Bowlby, J (1960). Grief and mourning in infancy and early childhood. *The Psychoanalytic Study of the Child*, **VX**, pp. 3 - 39.

Bowlby, J. (1969). *Attachment and Loss, Volume. 1: Attachment*, London: Hogarth.

Bowlby, J. (1973). *Attachment and Loss: Volume 2. Separation. Anxiety and Anger*. London: Hogarth.

Bowlby, J. (1988). *Attachment and Loss, Volume. 3. Loss: Sadness and Depression*. London: Hogarth.

Bowlby, J. (1991). *Attachment and Loss, Vol. 1: Attachment*. (2nd ed.) London: Penguin Books.

Brazelton, T. B. and Cramer, B. G. (1990). *The Earliest Relationship*. New York: Addison-Wesley.

Bretherton, I. (1980). Young children in stressful situations: The supporting role of attachment figures and unfamiliar caregivers. in Coelho, G. V. and Ahmed, P. I. (eds.) *Uprooting and development*. New York: Plenum Press, pp. 179 - 210.

Bretherton, I. (1992). The Origins of Attachment Theory: John Bowlby and Mary Ainsworth. *Developmental Psychology*, **28**(5), pp. 759 -775.

Brewer, J. and Hunt, A. (1989). *Multimethod research: A synthesis of styles*. Newbury Park, CA: Sage.

Burman, E. (1999). Interviewing. in Bannister, P., Burman, E., Parker, I., Taylor, M. and Tindall, C. (eds.) *Qualitative Methods in Psychology. A research guide*. Buckingham: Open University Press, pp. 49 - 71

Caccia, N., Johnson, J. M., Robinson, G. E. and Barna, T. (1996). Impact of Prenatal Testing on Maternal-Fetal Bonding: Chorionic Villus Sampling versus Amniocentesis. *American Journal of Obstetrics and Gynaecology*, **165**, pp. 1122 - 1125.

Campbell, D. T. and Fiske, D. (1959). Convergent and discriminate validation by multitrait-multimethod matrix. *Psychological Bulletin*, **56**, pp81 - 105

Cannella, B. L. (2005). Maternal-fetal attachment: an integrative review. *Journal of Advanced Nursing*, **50**(1), pp 60 -68.

Carter-Jessop, L. (1981). Promoting maternal attachment through prenatal intervention. *American Journal of Maternal Child Nursing*, **6**, pp 107 - 112.

Cassidy, J (1999). *The Nature of the Child's Ties*. in Cassidy, J and Shaver, P. R. (eds.) *Handbook of Attachment. Theory, Research and Clinical Applications*. New York: The Guilford Press, pp. 3 - 20

Cassidy, J and Shaver, P. R. (1999). (Eds.) *Handbook of Attachment. Theory, Research and Clinical Applications*. New York: The Guilford Press.

Chamberlain, K. (1995). *What is Grounded Theory?* [on-line]. (6 November 1995). [cited 27 January 2009]. Accessed via Kerlins.net at:
<http://kerlins.net/bobbi/research/qualresearch/bibliography/gt.html>.

Cherryholmes, C. C. (1992). Notes on pragmatism and scientific realism. *Educational Researcher*, **21**, pp. 13 -17.

Clarke-Carter, D. (2001). *Doing Quantitative Psychological Research: From Design to Report*. Hove: Psychology Press Ltd.

Clutton-Brock, T. and Godfray, C. (1991) Parental Investment. in Krebs, J. R. and Davies, N. B. *Behavioural ecology: An evolutionary approach*. 3rd ed., Oxford: Blackwell Science.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences*. 2nd ed., New Jersey: Lawrence Erlbaum.

Cohen, S. and Ashby Wills, T. (1985) Stress, social support and the buffering hypothesis. *Psychological Bulletin*, **98**, pp. 310 - 357.

Cohen, R.J., Swerdlik, M.E. and Philips, S.M. (1996). *Psychological Testing and Assessment: An Introduction to Tests and Measurement*. 3rd ed., California: Mayfield Publishers.

Cole, M. and Cole, S. R. (1996). *The development of children*. New York: Freeman.

Colpin, H., DeMunter, A., Nys, K. and Vandemeulebroecke, L. (1998). Prenatal attachment in future parents of twins. *Early Development and Parenting*, **7**, pp. 223 - 227.

Condon, J. T. (1985). The prenatal-foetal relationship - A comparison of male and female expectant parents. *Journal of Psychosomatic Obstetrics and Gynaecology*, **4**, pp. 271 - 284.

Condon, J. T. (1993). The assessment of antenatal emotional attachment: Development of a questionnaire instrument. *British Journal of Medical Psychology*, **66**, pp. 167 - 183.

Condon, J. T. and Corkindale, C. J. (1997). The Assessment of Parent-Infant Attachment: Development of a Self-Report Questionnaire Instrument. *Journal of Reproductive and Infant Psychology*, **16**, pp. 57 - 76.

Condon, J. T. and Dunn, D. J. (1988). The nature and determinants of parent-to-infant attachment in the early postnatal period. *Journal of the American Academy of Child and Adolescent Psychiatry*, **27**, pp. 293 - 299.

Condon, J. T. and Esuvaranathan, V. (1990). The influence of parity on the experience of pregnancy: A comparison of first and second time expectant couples. *British Journal of Medical Psychology*, **63**, pp. 369 - 377.

Connors, E and Glen, S.M. (1996). Methodological considerations in observing mother-infant interactions in natural settings. in Haworth, J. *Psychological Research: Innovative Methods and Strategies*. London: Routledge.

Corbetta, P. (2003). *Social research: theory, methods and techniques*. London: Sage.

Corbin, J. and Morse, J. M. (2003). The unstructured interactive interview: issues of reciprocity and risks when dealing with sensitive topics. *Qualitative Inquiry*, **9**(3), pp. 333 - 354.

Cote-Arsenault, D. (1999). Letter: Pregnancy after loss. *Journal of Obstetric, Gynaecology and Neonatal Nursing*, **28**(2), pp. 13 -14.

Cox, M. J., Owen, M. T., Henderson, V. K. and Margand, N. A. (1992). Prediction of infant-father and infant-mother attachment. *Developmental Psychology*, **28**, pp. 474 - 483.

Cranley, M. S. (1981a). Roots of Attachment: the Relationship of Parents with their Unborn. *Birth Defects: Original Article Series*, **XVII** (6), pp. 59 -83

Cranley, M. S. (1981b). Development of a tool for the measurement of maternal attachment during pregnancy. *Nursing Research*, **30**, pp. 281 -285.

Cranley, M. S. (1984). Social support as a factor in the development of parent's attachment to their unborn. *Birth Defects: Original Article Series*, **20**, pp. 99 - 124.

Creswell, J. W. (1995). *Research design: Qualitative and quantitative approaches*. London: Sage Publications.

Creswell, J.W. (2003). *Research Design. Qualitative, Quantitative, and Mixed Method Approaches*. 2nd ed., London: Sage Publications.

Cuckle, H. (1998). Antenatal Tests: Reassuring of Stress-Provoking? *RCM Midwives Journal*, 1(6), pp 177 - 179.

Datta, L. (1994). Paradigm wars: A basis for peaceful coexistence and beyond. in Reichardt, C. S. and Rallis, S. F. (eds.). *The qualitative - quantitative debate: New perspectives*. San Francisco: Jossey-Bass, pp 53 -70.

Della Vedova, A. M., Dabrassi, F. and Imbasciati, A. (2008). Assessing prenatal attachment in a sample of Italian women. *Journal of Reproductive and Infant Psychology*, 26(2), pp 86 -98.

Della Vedova, A. and Imbasciati, A. (1998). The origin of the mind: The psychic life of the foetus. *Giornale di neuropsichiatria dell'eta evolutiva*, 18(374), pp 155 -168. in Della Vedova, A. M., Dabrassi, F. and Imbasciati, A. (2008). Assessing prenatal attachment in a sample of Italian women. *Journal of Reproductive and Infant Psychology*, 26(2), pp 86 -98.

Denzin, N. K. and Lincoln, Y. S. (eds.) (1994). *Handbook of Qualitative Research*. London: Sage.

Department for Education and Skills; Department of Health. (2004). *National Services Framework for Children, Young People and Maternity Services*. London: HMSO.

Diaz, M. A., Le, H. N., Cooper, B. A. and Munoz, R. F. (2007). Interpersonal factors and perinatal depressive symptomatology in a low-income Latina sample. *Cultural Diversity and Ethnic Minorities Psychology*, 13(4), pp. 328 - 336.

Digman, J. M. (1990). *Personality structure: Emergence of the five factor model*. In Rosenzweig, M. R. and Porter, L. W. (eds.) *Annual Review of Psychology*, 41, 417 - 440.

Doan, H. McK. and Zimerman, A. (2003). Conceptualising Prenatal Attachment: Towards a Multidimensional View. *Journal of Prenatal and Perinatal Psychology and Health*, **18**(2), pp. 109 - 129.

Doan, H. McK., Cox, N. L. and Zimerman, A. (2003). The Maternal Fetal Attachment Scale: Some Methodological Ponderings. *Journal of Prenatal and Perinatal Psychology and Health*, **18**(2), pp.167 - 187.

Draper, P. and Harpending, H. (1988). *A sociobiological perspective on human reproductive strategies*. in MacDonald, K. (ed.) *Sociobiological perspectives on human development*. New York: Springer-Verlag.

Dulude, D., Belanger, C., Wright, J. and Sabourin, S. (2002). High-risk pregnancies, psychological distress, and dyadic adjustment. *Journal of Reproductive and Infant Psychology*, **20**(2), pp. 101 - 123.

Durkin, S., Morse, C. and Buist, A. (2001). The factor structure of pre-natal psychological and psychosocial functioning in first-time expectant parents. *Journal of Reproductive and Infant Psychology*, **19**(2), pp. 121 - 134

Dykes, K. and Stjernqvist, K. (2001). The importance of ultrasound to first-time mothers' thoughts about their unborn child. *Journal of Reproductive and Infant Psychology*, **19**(2), pp95 -104.

Eibl-Eibesfeldt, I. (1989). *Human Ethology*. New York: Aldine de Gruyter.

Eppel, A. B. (2005). A psychobiological view of borderline personality construct. [online]. (Accepted for publication August9th, 2005). [cited 11th March 2009]. Accessed via Google at:
http://www.scielo.br/pdf/rprs/v27n3/en_v27n3a0

Fifer, W. P. and Moon, C. (1995). The effects of fetal experience with sound. in Lecanuet, J. P., Krasnegor, N. A., Fifer, W. P. and Smotherman, W. P. (eds.) *Fetal development: A psychobiological perspective*. Hillsdale: Erlbaum, pp351 - 366.

Figueiredo, B., Field, T., Diego, M., Hernandez-Reif, M., Deeds, O. and Ascencio, A. (2008). Partner relationships during transition to parenthood. *Journal of Reproductive and Infant Psychology*, **26**(2), pp. 99 -107.

- Foddy, W. (1993). *Constructing questions for interviews and questionnaires*. Cambridge: Cambridge University Press.
- Fonagy, P., Steele, H and Steele, M. (1991). Maternal Representations of Attachment during Pregnancy Predict the Organisation of Infant-Mother Attachment at One Year of Age. *Child Development*, **62**, pp 891 -905.
- Ford, M. ad Hodnett, E. (1990). Predictors of adaptation in women hospitalised during pregnancy. *Canadian Journal of Nursing Research*, **22**, pp. 37 - 50.
- Frankfort-Nachmias, C. and Nachmias, D. (1996). *Methods in the Social Sciences*. 5th ed., London: Arnold.
- Froman, R. D. (2001). Elements to considering in planning the use of factor analysis. *Southern Online Journal of Nursing Research*, **5**(2), pp. 1 - 22.
- Frost, M. and Condon, J. T. (1996). The psychological sequelae of miscarriage: A critical review of the literature. *Australian and New Zealand Journal of Psychiatry*, **30**, pp. 54 - 62.
- Fuller, J. R. (1990). Early patterns of maternal attachment. *Health Care for Women International*, **11**, pp. 433 - 446.
- Gaffney, K. F. (1986). Maternal-fetal attachment in relation to self-concept and anxiety. *Maternal-Child Nursing Journal*, **15**(2), pp. 91 - 101.
- Gau, M-L and Lee, T-L (2003). Construct Validity of the Prenatal Attachment Inventory: A Confirmatory Factor Analysis Approach. *Journal of Nursing Research*, **11**(3), pp. 177 -186.
- Gay, J. (1981). A conceptual framework of bonding. *Journal of Obstetric, Gynaecological and Neonatal Nursing*; **10**(6), pp. 440 - 444.
- Gearing, R. E. (2004). Bracketing in research: A typology. *Qualitative Health Research*. **14**, pp. 1429 - 1452
- George, C. and Solomon, J. (1999). Attachment and Caregiving: The Caregiving Behavioural System. in Cassidy, J and Shaver, P. R. (eds.) *Handbook of Attachment. Theory, Research and Clinical Applications*. New York: The Guilford Press, pp. 649 - 670.

Gjerdingen, D. K. and Chaloner, K. (1994). Mother's experience with household roles and social support during the first postpartum year. *Women and Health*, **21**, pp. 57 - 74.

Glaser, B. G. and Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. New York: Aldine.

Gottlieb, G. (1991). Experiential Canalisation of Behaviour Developmental Theory. *Developmental Psychology*, **27**(1), pp 4 - 13.

Gottlieb, G. (1998). Normally Occurring Environmental and Behavioural Influences on Gene Activity: From Central Dogma to Probabilistic Epigenesis. *Psychological Review*, **54**(4), pp. 792 - 802

Gottlieb, G. (2000). Environmental and Behavioural Influences on Gene Activity. *Current Directions in Psychological Science*, **9**, pp. 93 97.

Gottlieb, L. (1978). Maternal attachment in primiparas. *Journal of Obstetric, Gynaecological and Neonatal Nursing*, **7**, pp. 39 -44.

Goulet, C., Bell, L., St CyrTribble, D., Paul, D. and Lang, A. (1998). A concept analysis of parent-infant attachment. *Journal of Advanced Nursing*, **28**(5), pp. 1071 - 1081.

Grace, J. T. (1984). Does a mother's knowledge of fetal gender affect attachment? *American Journal of Maternal Child Nursing*, **2**, pp. 42 -45.

Grace, J. T. (1989). Development of maternal-fetal attachment during pregnancy. *Nursing Research*, **38**(4), pp. 228 - 232.

Grantham, C. (2002). *Women's Health Issues*. [Accessed 04-10-07].
<http://www.cwrl.utexas.edu/~ulrich/feminist/medicine>.

Green, J. M., Coupland, V. A. and Kitzinger, J. V. (1998). *Great expectations - a prospective study of women's expectations and experiences of childbirth*. Cheshire: Books for Midwives Press.

Grossmann, K., Fremmer-Bombik, E., Rudolph, J. and Grossmann K. E. (1988). Maternal attachment representations as related to patterns of infant-mother attachment and maternal care during the first year of life. *in* Hinde R. A. and

Stevenson-Hinde, J. (eds.) *Relationships within Families: Mutual Influences*. Oxford: Oxford University Press.

Guba, E. G. and Lincoln, Y. S. (1994). Competing paradigms in qualitative research. in Denzin, N. K. and Lincoln, Y. S. (eds.) *Handbook of qualitative research*. Thousand Oaks, CA: Sage.

Gubrium, J. and Holstein, J. (eds.) (2001). *Handbook of interview research*. London: Sage.

Haedt, A. and Keel, P. (2007). Maternal attachment, depression and body dissatisfaction in pregnant women. *Journal of Reproductive and Infant Psychology*, **25**(4), pp. 285 - 295.

Hagan, E. H. (2002). *What is evolutionary psychology?* [Accessed 04.01.08]. <http://www.anth.ucsb.edu/projects/human/epfaq/ep.html>.

Hamilton, W. D. (1964). The genetical evolution of social behaviour. *Journal of Theoretical Biology*, **7**, pp. 1 -52.

Hardeman, W., Johnston, M., Johnston, D. W., Bonetti, D., Wareham, N. J and Kinmonth, A. L. (2002). Application of the theory of planned behaviour change intervention: A systematic review. *Journal of Psychology and Health*, **17**(2), pp. 123 - 158.

Hayes, N. (ed.) (1998). *Doing Qualitative Analysis in Psychology*. Hove: Psychology Press Ltd.

Hayes, N. (2000). *Doing Psychological Research*. Buckingham: Open University Press.

Hazan, C. and Shaver, P. (1987). Romantic love conceptualised as an attachment process. *Journal of Personality and Social Psychology*, **52**, pp.511 - 524.

Heaman, M. (1998). Psychological impact of high risk pregnancy: Hospital care and home care. *Clinical Obstetrics and Gynaecology*, **41**, pp. 629 - 639.

Heinrich, S. M. and Cranley, M. S. (1989). Effect of fetal movement, ultrasound scan and amniocentesis on maternal-fetal attachment. *Nursing Research*, **38**, pp. 81 - 84.

Henwood, K. and Pidgeon, N. (1995). Grounded theory and psychological research. *The Psychologist*, **3**, pp. 115 - 118.

Gubrium, J. and Holstein, J. (eds.) (2001). *Handbook of interview research*. London: Sage

Howe, K. R. (1988). Against the quantitative - qualitative incompatibility thesis or dogma die hard. *Educational Researcher*, **17**, pp. 10 - 16.

Howes, C., Rodning, C., Galluzzo, D. and Myers, I. (1988). Attachment and childcare: Relationships with mother and caregivers. *Early Childhood Research Quarterly*, **3**, pp. 403 - 416.

<http://www.cyberparents.com/love/what-is-love.htm> [accessed 28-01-08]

Hutchinson, C. (2007). A young mother's midwifery scheme. *Midwives. The official journal of the Royal College of Midwives*, **10**(7), pp. 82 84.

Isabella, R. A. (1993). Origins of attachment: Maternal interactive behaviour across the first year. *Child Development*, **64**, pp. 605 - 621.

Isabella, R. A. and Belsky, J. (1991). Interactional synchrony and the origins of infant-mother attachment. A replication study. *Child Development*, **62**, pp. 373 - 384.

Johnson, J. M. (2001). In-depth interviewing. in Gubrium, J. and Holstein, J. (eds.) *Handbook of interview research*. London: Sage

Karen, R. (1994). *Becoming Attached: Unfolding the Mystery of the Infant-Mother Bond and its Impact on Later Life*. New York: Warner Books.

Kemp, H. V. and Page, C. K. (1987). Maternal pre-natal attachment in normal and high-risk pregnancies. *Journal of Obstetric, Gynaecological and Neonatal Nursing*, **16**, pp. 179 -184.

Klaus, M. H. and Kennell, J. H. (1976). *Parent-Infant Bonding*. St. Louis: Mosby.

Kline, P. (1993). *The Handbook of Psychological Testing*. London: Routledge.

- Kohn, C. L., Nelson, A. and Weiner, S. (1980). Gravid's responses to real-time ultrasound fetal images. *Journal of Obstetric, Gynaecological and Neonatal Nursing*, **9**, pp. 77 - 80.
- Lacey, A. and Luff, D. (2001). *Trent Focus for Research and Development in Primary Care: Qualitative Data Analysis*. Trent Focus Group.
- Laxton-Kane, M. and Slade, P. (2002). The role of maternal prenatal attachment in a woman's experience of pregnancy and the implications for the process of care. *Journal of Reproductive and Infant Psychology*, **20** (4), pp251 - 266.
- Leiffer, M. (1977). Psychological changes accompanying pregnancy and motherhood. *Genetic Psychology Monographs*, **95**, 55 - 96.
- Lincoln, Y. S. and Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills: Sage.
- Lincoln, Y.S. and Guba, E.G. (2000). Paradigmatic controversies, contradictions and emerging confluences. in Denzin N.K. and Lincoln Y.S. (eds.) *Handbook of Qualitative Research*. (2nd ed.) Thousand Oaks, CA: Sage.
- Lindgren, K. (2001). Relationship among maternal-fetal attachment, prenatal depression and health practices in pregnancy. *Research in Nursing and Health*, **24**, pp. 203 -217.
- Lobar, S. L. and Philips, S. (1992). A clinical assessment strategy for maternal acquaintance-attachment behaviours. *Issues in Comprehensive Pediatric Nursing*, **15**, 249 -259.
- LoBiondo-Wood, G. (1985). The progression of physical symptoms in pregnancy and the development of maternal-fetal attachment. *Dissertation Abstracts International*, **46**, 2625B
- Loudon, T (2000). Maternal mortality in the past and relevance to developing countries today. *American Journal of Clinical Nutrition*, **70**(1), pp. 241 -246.
- Gubrium, J. and Holstein, J. (eds.) (2001). *Handbook of interview research*. London: Sage
- Lovejoy, O. (1981) The Origins of Man. *Science*, **211**, pp. 341 -350.

Low, J. (2007). Unstructured Interviews and Health Research. *in* Saks, M and Allsop, J. (eds.) *Researching Health: Qualitative, Quantitative and Mixed Methods*. London: Sage Publications Ltd.

Lumley, J. (1973). The development of maternal-fetal bonding in the first pregnancy. Third International Congress: Psychomatic Medicine in Obstetrics and Gynaecology. Basle: Karger.

Lumley, J. (1982). Attitudes to the fetus among primigravidae. *Australian Pediatric Journal*, **18**, pp. 106 109.

MacDonald, K. (1992). Warmth as a Developmental Construct: An Evolutionary Analysis. *Child Development*, **63**, pp 753 - 773.

MacLeod, A. J. and Weaver, S. M. (2003). Teenage pregnancy: attitudes, social support and adjustment to pregnancy during the antenatal period. *Journal of Reproductive and Infant Psychology*, **21**(1), pp 49 - 59.

Main, M. (1990). Cross-Cultural Studies of Attachment Organisation: Recent Studies, Changing Methodologies, and the Concept of Conditional Strategies. *Human Development*, **33**, pp 48 - 61.

Main, M. (1991). Metacognitive knowledge, metacognitive monitoring and singular (coherent) vs. multiple (incoherent) models of attachment: findings and directions for future research. *in* Parkes, C., Stevenson-Hinde, J. and Morris, P. (eds.) *Attachment Across the Life Cycle*. London: Tavistock Routledge Press, pp. 127 - 159.

Main, M., Kaplan, N. and Cassidy, J. (1985). Security in infancy, childhood and adulthood: A move to the level of representation. *Monographs of the Society for Research in Child Development*, **50**(1 - 2 Serial No. 209), pp. 66 - 104.

Malmberg, L-E., Stein, A., West, A., Lewis, S., Barnes, J., Leach, P, Sylva, K. and The Family, Children and Child Care Project Team (2007). Parent-infant interaction: A growth model approach. *Journal of Infant Behaviour and Development*, **30**(4), pp. 615 - 630.

Massarik, F (1981). The interviewing process re-examined. *In* Reason, P and Rowan, J (eds.) *Human Inquiry: A Source Book of the New Paradigm Research*. Chichester: Wiley.

McCourt, C. (2006). Becoming a parent. *in* Page, L. A. and McCandlish, R. (eds.) *The New Midwifery. Science and Sensitivity in Practice*. 2nd ed., Philadelphia: Elsevier Ltd, pp21 - 47.

McCracken, G. (1988). *The Long Interview*. Newbury Park, CA: Sage.

Mercer, R. T. (1986). *First time motherhood: Experiences from teens to forties*. New York: Springer.

Mercer, R.T., Ferketich, S. L., May, K., DeJoseph, J. and Sollid, D. (1988). Further exploration of maternal and paternal fetal attachment. *Research in Nursing and Health*; **11**, pp. 83 - 95.

Mercer, M. E. and Ferketich S. L. (1990). Predictors of parental attachment during early parenthood. *Journal of Advanced Nursing*, **15**, pp. 268 - 280.

Mercer, M. E. and Ferketich, S. L. (1993). Factor Analysis of the Maternal Fetal Attachment Scale. *Nursing Research*, **42** (3) pp.144 -147.

Mercer, M. E. and Ferketich S. L. (1994). Predictors of maternal role competence by risk status. *Nursing Research*, **43**, pp. 38 - 43.

Mercer, M. E. and Ferketich S. L. (1995). Experienced and inexperienced mother's maternal competence during infancy. *Research in Nursing and Health*, **18**, pp. 333 - 343.

Miller, G. A., Galanter, E. and Pribram, K. H. (1960). *Plans and the structure of behaviour*. New York: Holt, Rinehart and Winston.

Moon, C., Bever, T. G. and Fifer, W. P. (1992). Canonical and non-canonical syllable discrimination by two-day-old infants. *Journal of Child Language*, **19**, pp 1 - 17.

Morgan, D. (1998). Practical strategies for combining qualitative and quantitative methods: Applications to health research. *Qualitative Health Research*, **8**(3), pp. 362 - 376.

Morse, J.M. (1991). Approaches to qualitative - quantitative methodological triangulation. *Nursing Research*, **40**(1), pp. 120 - 123.

- Muller, M. E. (1992). A Critical Review of Prenatal Attachment Research. *Scholarly Inquiry for Nursing Practice: An International Journal*, **6**(1), pp. 5 - 22.
- Muller, M. E. (1993). Development of the Prenatal Attachment Inventory. *Western Journal of Nursing Research*, **15**(2), pp. 199 -215.
- Neuman, W.L. (2000). *Social research methods: qualitative and quantitative approaches*. (4thed.) Boston: Allyn and Bacon.
- Nevill, A.M, Lane, A.M., Kilgour, A.M., Bowes, N. and Whyte, G.P. (2000). Stability of psychometric questionnaires. *Journal of Sports Sciences*, **19**(4), 273 - 278.
- Nursing and Midwifery Council (2004). *Midwives rules and standards*_London: NMC Publications.
- Norusis, M. J. (2003). *SPSS 12.0. Statistical Procedures Companion*. New Jersey, USA: Prentice Hall Inc.
- Page, L. A. and McCandlish, R. (2007). (eds.) *The New Midwifery. Science and Sensitivity in Practice*. 2nd ed. Philadelphia: Churchill Livingstone Elsevier.
- Panskepp, J. (1989). The psychobiology of the emotions. *in* Wagner, H and Manstead, A. (eds.) *Handbook of social psychophysiology*. Chichester: Wiley, pp. 5 -26.
- Panskepp, J. (1998). *Affective neuroscience*. New York: Oxford University Press.
- Panskepp, J. (2003). Feeling the pain of social loss. *Science*, **302**, pp 237 - 239.
- Patton, M.Q. (1990). *Qualitative evaluation and research methods*. (2nded.) Newbury Park CA: Sage.
- Peterson-Sweeney, K. (2005). The use of focus groups in pediatric and adolescent research. *Journal of Pediatric Health Care*, **19**, pp 104 - 110.

- Phipps, S. and Zimm, A. B. (1986). Psychological response to amniocentesis: Mood state and adaptation to pregnancy. *American Journal of Medical Genetics*, **23**, pp 131 - 142.
- Pidgeon, N and Henwood, K. (1998). Using grounded theory in psychological research. In Hayes, N. (ed.) *Doing Qualitative Analysis in Psychology*. East Sussex: Psychology Press Ltd, pp. 245 - 286.
- Polan, H. G. and Hofer, M. A. (1999). Psycho - Biological Origins of Infant Attachment and Separation Responses. in Cassidy, J and Shaver, P. R. (eds.) *Handbook of Attachment. Theory, Research and Clinical Applications*. New York: The Guilford Press, p 162 - 180.
- Polit, D. F. and Hungler, B.P. (1995). *Nursing Research. Principles and Methods*. (5thed.) Philadelphia: J. B. Lippincott Company.
- Probert, A. (2006). Searching for an Appropriate Research Design: A Personal Journey. *Journal of Research Practice* [on-line]. **2**(1), Article D3, [cited 23 January 2009]. Available via Google at:
<http://jrp.icaap.org/index.php/jrp/article/view/24/44>.
- Raphael-Leff, J. (1991). *Psychological Processes of Childbearing*. London: Chapman Hall.
- Reading, A. E., Cox, D. N., Sledmere, C. M. and Campbell, S. (1984). Psychological changes over the course of pregnancy: A study of attitudes towards the fetus / neonate. *Health Psychology*, **3**, pp. 211 - 221.
- Reber, A. S. (1995). *Dictionary of Psychology*. 2nd ed., London: Penguin Books
- Redshaw, M. (2006). First relationships and the growth of love and commitment. in Page, L. A. and McCandlish, R. (eds.) *The New Midwifery. Science and Sensitivity in Practice*. 2nd ed., Philadelphia: Elsevier Ltd, pp21 - 47.
- Reichardt, C. S. and Rallis, S. F. (1994). Qualitative and quantitative inquiries are not incompatible: A call for a new partnership. in Reichardt, C. S. and Rallis, S. F. (eds.). *The qualitative - quantitative debate: New perspectives*. San Francisco: Jossey-Bass, pp 85 -92.

Reynolds, P.D. (1979). *Ethical Dilemmas and Social Science Research*. San Francisco

Ricks, M. H. (1985). The social transmission of parental behaviour: Attachment across generations. *Monographs for the Society for Research in Child Development*, **50**(1 - 2 Series 209), pp. 211 - 227.

Righetti, P. L., Dell'Avanzo, M., Grigio M. and Nicolini, U. (2005). Maternal / paternal antenatal attachment and fourth-dimensional ultrasound technique: A preliminary report. *British Journal of Psychology*, **96**, pp 129 - 137

Robertson, J. and Bowlby, J (1952). Responses of young children to loss of maternal care. *Courrier of the International Children's Centre, Paris*, **II**, pp. 131 - 140

Rolls, E. T. (1999). *The Brain and Emotion*. Oxford: Oxford University Press.

Rossmann, G.B. and Wilson, B.L. (1985). *Numbers and words: Combining quantitative and qualitative methods in a single large-scale evaluation study*. *Evaluation Review*, **9**(5), pp. 627 - 643.

Rubertsson, C., Waldenstrom, U. and Wickberg, B. (2003). Depressive mood in early pregnancy: prevalence and women at risk in a national Swedish sample. *Journal of Reproductive and Infant Psychology*, **21**(2), pp. 113 -123.

Rubertsson, C., Waldenstrom, U., Wickberg, B., Radested, I. and Hildigsson, I. (2005). Depressive mood in early pregnancy and postpartum: prevalence and women at risk in a national Swedish sample. *Journal of Reproductive and Infant Psychology*, **23**(2), pp. 117 -119.

Rubin, R. (1975). Maternal tasks in pregnancy. *Maternal-Child Journal*, **4**, pp. 143 - 153.

Rubin, R. (1977). Binding-in the postpartum period. *Maternal-Child Nursing*, **4**, pp. 67 - 75.

Rubin, R. (1984). *Maternal identity and the maternal experience*. New York: Springer.

Rust, J. and Golombok, S. (2000) *Modern Psychometrics. The Science of Psychological Assessment*. 2nd ed., London: Routledge.

Rutter, M. and Rutter, M. (1993). *Developing minds: challenges and continuities across the lifespan*. Harmondsworth: Penguin.

Rutter, M. (1979). Separation experiences: a new look at an old topic. *Journal of Pediatrics*, **95**, pp. 147 - 154.

Rutter, M. (1981). *Maternal deprivation reassessed*. 2nd ed., Harmondsworth: Penguin.

Rutter, M. (1991). A fresh look at maternal deprivation. in P. Bateson (ed.) *The development and integration of behaviour*. Cambridge: Cambridge University Press.

Rutter, M. (1995). Clinical Implications of Attachment: Retrospect and Prospect. *Journal of Child Psychology and Psychiatry*, **36**, pp. 549 - 571.

Salisbury, A., Law, K., LaGasse, L. and Lester, B. (2003). Maternal-Fetal Attachment. *Journal of the American Medical Association*, **289**(13), p. 1701.

Sameroff, A. J. and Emde, R. N. (1989). *Relationship disturbances in early childhood: a developmental approach*. New York: Basic Books.

Sandbrook, S. P. and Adamson-Macedo, E. N. (2004). Maternal-fetal attachment: searching for a new definition. *Neuroendocrinology Letters*, **25**(Supplement 1), pp. 169 - 182.

Schaffer, H. R. and Emerson, P. E. (1964). The development of social attachments in infancy. *Monographs of the Society for Research in Child Development*, **29**(3, Serial No 94), 1 - 77.

Schaffer, H. R. (1990). *Making decisions about children: psychological questions and answers*. Oxford: Blackwell.

Schwandt, T.A. (2000). *Three epistemological stances of qualitative inquiry*. in Denzin N.K. and Lincoln Y.S. (eds.) *Handbook of Qualitative Research*. (2nd ed.) Thousand Oaks, CA: Sage.

Scott, D. A. and Hill, J. (2001). Stability and change in parenting beliefs in first-time mothers from pre to post natal period. *Journal of Reproductive and Infant Psychology*, **19**(2), pp. 105 -119.

Siddiqui, A., Hagglof, B. and Eisemann, M. (1999). An exploration of prenatal attachment in Swedish expectant women. *Journal of Reproductive and infant Psychology*, **17**(4), pp. 369 -380.

Siddiqui, A., Hagglof, B. and Eisemann, M. (2000). Own memories of upbringing as a determinant of prenatal attachment in expectant women. *Journal of Reproductive and Infant Psychology*, **18**(1), pp67 - 74.

Sigvardsson, S., Bohman, M. and Cloninger, C.R. (1987). Structure and stability of childhood personality: Prediction of later social adjustment. *Journal of Child Psychology and Psychiatry*, **28**, pp. 929 - 946.

Simpson, J. A. (1999). Attachment Theory in Modern Evolutionary Perspective. in Cassidy, J and Shaver, P. R. (eds.) *Handbook of Attachment. Theory, Research and Clinical Applications*. New York: The Guilford Press, p 115 - 140.

Sjogren, B., Edman, G., Widstrom, A. M., Mathiesen, A. S. and Uvnas-Moberg, K. (2004). Maternal foetal attachment and personality during first pregnancy. *Journal of Reproductive and Infant Psychology*, **22**(2), pp. 57 - 69.

Snyder, D (1984). Effects of long-term hospitalisation on the antepartum patient. *NAACOG Update Series*, **1**(19). Princeton: Continuing Professional Education Centre.

Sokolowski, R. (2000). *Introduction to phenomenology*. Cambridge: Cambridge University Press.

Solomon, J. and George, C. (1996). Defining the care-giving system: Towards a theory of care-giving. *Infant Mental Health Journal*, **17**, pp. 183 -187.

Sroufe, L. A. (1986). Bowlby's contribution to psychoanalytical theory and developmental psychology. *Journal of Child Psychology and Psychiatry*, **27**, pp. 841 - 849.

Sroufe, L. A. and Fleeson, J. (1986). Attachment and the construction of relationships. in Hartup, W. W. and Rubin, Z. (eds.) *Relationships and development*. Hillsdale: Erlbaum, pp. 51 - 71.

Sroufe, A. L and Sampson, M. C. (2000). Attachment Theory and Systems Concept. *Human Development*, **43**, pp. 321 - 326.

Stainton, M. C., McNeil, D. and Harvey, S. (1992). Maternal tasks of uncertain motherhood. *Maternal-Child Nursing Journal*, **20**/ pp. 113 - 123.

Starks, H. and Brown Tindall, S. (2007). Choose Your Method: A Comparison of Phenomenology, Discourse Analysis, and Grounded Theory. *Qualitative Health Research*, **17**(10), pp.1372 - 1380.

Strauss, A. L. (1987). *Qualitative Analysis for Social Scientists*. New York: Cambridge University Press.

Strauss, A. L. and Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park: Sage.

Streiner, D.L and Norman, G.R. (1995). *Health Measurements Scales. A practical guide to their development and use*. 2nd ed., Oxford: Oxford University Press.

Tashakkori, A. and Teddlie, C. (eds.) (2003). *Handbook of mixed methods in the social and behavioural sciences*. Thousand Oaks, CA: Sage.

The British Psychological Society (1992). *Ethical Principles for conducting Research with Human Participants* [online]. [accessed 14 August 2008]. Available from: <http://www.bps.org.uk/thesociety/code-of-conduct/ethical-principles-for-conducting-research>.

The British Psychological Society (2006). *Code of Ethics and Conduct* [online]. Leicester: The British Psychological Society. [accessed 14 August 2008]. Available from: http://www.bps.org.uk/INF94/03.206/downloadfile.cfm?file_uid

Tindall, C. (1999). Issues of Evaluation. in Bannister, P., Burman, E., Parker, I., Taylor, M. and Tindall, C. (eds.) *Qualitative Methods in Psychology. A research guide*. Buckingham: Open University Press, pp. 142 - 159.

van Teijlingen, E.R and Cheyne, H. L. (2004). Ethics in Midwifery Research. *RCM Midwives Journal*, **6**, pp. 208 -210.

van Teijlingen, E.R and Pitchforth, E. (2007). Focusing the group. *RCM Midwives Journal*, **10**(2), pp. 78 - 80.

Wawer, M. (2006). Age and perception of motherhood in primiparous women. *Unpublished Master's Dissertation*. Lodz: University Lodzki

Weiss, R. S. (1975). *Marital separation*. New York: Basic Books.

Weiss, R. S. (1982). Attachment in adult life. in Parkes, C. M. and Hinde, J. S. (eds.) *The place of attachment in human behaviour*. New York: Basic Books pp. 171 - 184.

Westbrook, M. (1978). The reaction to childbearing and early maternal experience of women with differing marital relationships. *British Journal of Medical Psychology*, **51**, pp. 191 - 199.

White, O., McCorry, N. K., Scott-Heyes, G., Dempster, M. and Manderson, J. (2008). Maternal appraisals of risk, coping and prenatal attachment among women hospitalised with pregnancy complications. *Journal of Reproductive and Infant Psychology*, **26**(2), pp. 74 -85.

Williams, S. (2003). Beyond meaning, discourse and the empirical world: critical realist reflections on health. *Social Theory and Health*, **1**, pp. 42 - 47.

Wilson, M. E., White, M. A., Cobb, B., Curry, R., Greene, D. and Popovich, D. (2000). Family dynamics, parental-fetal attachment and infant temperament. *Journal of Advanced Nursing*, **31**, pp. 204 -210.

Winnicott, D. W. (1958). *Collected Papers: Through Paediatrics to Psychoanalysis*. New York: Basic Books.

Yali, A. M. and Lobel, M. (1999). Coping and distress in pregnancy. An investigation of medically high-risk women. *Journal of Psychosomatic Obstetric and Gynaecology*, **20**, pp. 39 -52.

Zachariah, R. (1994). Maternal-Fetal Attachment: Influence of Mother-Daughter and Husband-Wife Relationships. *Research in Nursing and Health*, **17**, 37-44.

Zeanah, C. H., Keener, M. A., Stewart, L. and Anders, T. F. (1985). Prenatal perception of infants' personality: a preliminary investigation. *Journal of the American Academy of Child Psychiatry*, **24**, pp. 204 - 210.

Zeanah, C. H., Zeanah, P. D. and Stewart, L. K. (1990). Parents construction of their infants personalities before and after birth: A descriptive study. *Child Psychiatry and Human Development*, **20**, 191 - 206.

Zimerman, A. and Doan, H. McK. (2003). Prenatal Attachment and Other feelings and Thoughts During Pregnancy in Three Groups of Pregnant Women. *Journal of Prenatal and Perinatal Psychology and Health*, **18**(2), pp.131 - 148.